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INVESTIGATION OF THE CONSONANT ENDINGS OF THE CHAOSHAN DIALECT: A RESULT OF LANGUAGE CONTACT AND HORIZONTAL TRANSMISSION

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A Thesis Presented

by

JIN CHEN

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ABSTRACT

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This thesis studies the inter-group variation of the consonant endings among five principal subgroups of the Chaoshan dialect, a branch of the South Min dialect in Eastern Guangdong Province, from the perspective of language contact and horizontal transmission. I conduct a quantitative study to present the synchronic variance of the consonant endings among five Chaoshan subgroups and the diachronic variance from Middle Chinese to modern Chaoshan dialect on a numerical scale.

The current literature tends to take the change of the consonant endings as a process of weakening governed by regular rules. My research findings challenge this conventional view. First, the change of the consonant endings from Middle Chinese to five subgroups of modern Chaoshan dialect is irregular, which is an exception to the linguistic laws proposed in the existing literature. Secondly, I find that some characters without consonant endings or with a weakened ending in Chaozhou in the 19th century reverse to have a consonant ending in modern Chaoshan dialect. This reversal contradicts to the weakening hypothesis that regards the change of the consonant endings as a process of simplifying. Finally, my quantitative research shows that Chaozhou dialect in the 19th century in much closer to modern Xiamen dialect than to five subgroups of

modern Chaoshan dialect in terms of the relativeness in consonant endings, which is the opposite to the prediction that languages become more and more different and have no consequent contact with other daughter languages after separating from the proto-language.

We propose that the actual situation of the consonant endings in different subgroups of the Chaoshan dialect can be better explained from the perspective of language contact and horizontal transmission. The interaction between Han Chinese and non-Han Chinese is the primary reason for the change of the consonant endings of the Chaoshan dialect. Also, the language contact between Chaoshan aborigines and migrants from the Fujian Province leads to the divergence of the consonant endings in different Chaoshan subgroups. Population structure and other social factors determine what phonetic features survive after several times of horizontal transmission.

TABLE OF CONTENTS

LIST OF TABLES

Table Page

LIST OF FIGURES

Figure Page

CHAPTER 1

INTRODUCTION

Chaoshan dialect is a branch of the South Min dialect mainly spoken in Eastern Guangdong Province, including Shantou city, Chaozhou city, Jieyang city, and Shanwei city, which roughly corresponds to the five principal subgroups in the Chaoshan dialect. All of them share the same initial consonants, while the number of their finals varies. Specifically, the preservation of the plosive and nasal consonant endings in colloquial reading varies among five major subgroups of the Chaoshan dialect --- there are three plosive consonant endings and three nasal consonant endings in Middle Chinese, while in five subgroups of modern Chaoshan dialect the retention of these consonant endings varies.

Previous studies on this inter-group divergence of consonant endings take the change of the consonant endings as a process of gradual weakening from Middle Chinese to the modern period[1], based on the assumption that sound change is regular and regular changes happen generally and uniformly regardless of the phonetic circumstances (Campbell 2013, 15). According to this hypothesis of weakening, there exists some regular rules governing the process of weakening --- whether the consonant ending is pertained or not is determined by the phonetic features such as the length or the number of the main vowel preceding the consonant ending (Li 1986, Zheng 2012). Different subgroups of the Chaoshan dialect broke up from the proto-language at different time,

1 According to Noman (1988: 24), the language of the *Qieyun* dictionary, which was compiled in AD 601 by Lu Fayan and is the pivot for the study of Chinese historical phonology, is identical to Middle Chinese. Middle Chinese refers to the period from the emergence of the Qieyun to the early fourteen centuries when Zhou Deqing codified the rhymes of Qu in the *Zhongyuan Yinnyun* 中原音韵, which is identified as the beginning of Old Mandarin.

thus they are located at different stages in the phonological evolution and therefore they have different consonant endings (Chen 2015). In this paper, I provide evidence challenging the hypothesis of weakening, and propose an alternative explanation from the perspective of horizontal transmission.

First, I compare the constant ending in modern Chaozhou dialect with that in the 19th century and find that some characters without consonant ending (or with a weakened consonant ending) in the 19th century regain consonant ending in modern Chaozhou dialect.[2] Such an seemingly reversal situation is an exception to the rule in historical linguistics that a subsequent change cannot restore the original distinctions after two phonetic features have merged (Campbell 2013: 18), and therefore cannot be explained by the weakening hypothesis in the tradition of historical linguistics.

From the perspective of historical linguistics assuming no consequent contact among daughters after separating from the proto-language, we could expect that the greater the distance between two languages from their proto-language, the fewer linguistic features they may share, and the less relevant they may become (Schmidt 1872). However, I show in the paper with quantitative evidence that Chaozhou dialect in the 19th century is much closer to modern Xiamen dialect than to the five subgroups of modern Chaoshan dialects in terms of the relativeness in consonant endings. This is the opposite to the prediction by historical linguistics --- since the Chaoshan dialect broke up from other branches of the South Min dialect in Yuan and Ming dynasty (Lin Lunlun

[2] Character, as the basic graphics unit, is monosyllabic, and a great majority of the characters in Chinese represent single characters. The morpheme is the smallest meaningful unit in a language (Noman 1988: 154). Even most of the characters are monosyllabic in Chinese, for those are polysyllabic the syllable of each character in these characters is tabulated and calculated independently in my research. Therefore, the term character rather than morpheme is used in my thesis.

1988: 141), the distance between Chaozhou dialect in the 19th century and modern Xiamen dialect (a subgroup of the South Min dialect) is much remoter than the distance between Chaozhou dialect in the 19th century and modern Chaoshan dialect, 19th century Chaozhou should share more features with modern Chaoshan than that with modern Xiamen. Therefore, the evidence casts doubt on the assertion that the distance of dialects is closely related to the distance in time.

Finally, the proposition that sound change is regular and sound laws suffer no exceptions cannot be applied to the situation of the consonant endings of the Chaoshan dialect. Previous studies hypothesize that the number or the length of the main vowels preceding the consonant ending determines whether the consonant will be preserved in a specific subgroup. However, these linguistic laws cannot generalize all the changes of the consonant endings of the Chaoshan dialect and cannot apply to different subgroups of the Chaoshan dialect generally and explain the divergence of the consonant endings among these subgroups.

I propose that the actual situation of the consonant endings in different subgroups of the Chaoshan dialect can be better understood from the perspective of language contact and horizontal transmission. According to the horizontal transmission theory, the interaction between languages and the contact among speakers who speak different dialects are the primary reasons for dialect formation and language change (Shen 2016). From this perspective, both the irregular and regular phonetic changes among five subgroups of the Chaoshan dialect are the results of the language contacts between the Chaoshan dialect and other dialects.

The rest of this chapter is organized as follows. Section 1.1 provides the background information of the Chaoshan Dialect and an overview on the inter-group difference in consonant endings among the subgroups. Representative explanations on this divergence are surveyed in Section 1.2, in which I also analyze their common limitations inherited form the tradition of historical linguistics. A brief introduction to the alternative framework in the perspective of language contact is presented in the last section[3].

1.1 An Overview of the Chaoshan Dialect

Chaoshan dialect, or Teochew Dialect, is a branch of South Min dialect mainly spoken in Eastern Guangdong Province, including Shantou city, Chaozhou city, Jieyang city, and Shanwei city as shown in Figure 2. Nowadays, the Chaoshan dialect is spoken by more than 30 million people, that is by the residents in the Chaoshan region and by their diaspora all over the world, such as Singapore, Thailand, and Cambodia.

The Chaoshan dialect is evolved from the Min dialect, and the Min dialect is evolved from the even more ancient Wu dialect (Li 1994: 296). The rudiment of the Chaoshan dialect can be traced back to the Qin and Han dynasties. Based on the historical records of the migration of the Han Chinese, it is likely that the initial period when the Chaoshan dialect separated from the Min dialect is from the Period of Warring States to the Three Kingdoms when the central plain culture begins to influence the Min region. From the Three Kingdoms to Southern and Northern Dynasties, the impact of the Wu

[3] Detailed survey and remarks on relevant research are deferred until Chapter5.

dialect on the Chaoshan dialect decreased and the Chaoshan dialect was exposed more to the influence of the Han Chinese from the central plains. Then in Tang and Song dynasties, as a result of the migration from north to south caused by social turmoil, and the officials being dispatched or relegated to the Chaoshan region, and the migration from the Fujian Province, the Chaoshan dialect became more and more different from other subgroups of the South Min dialect, and finally became an independent dialect in Yuan dynasty (Li 1994: 271-298).

Figure 1 The Map of Chinese Dialects with 10 Dialect Groups. Reprint from: *https://luckytoilet.wordpress.com/2019/07/16/learning-the-teochew-chaozhou-dialect/*

Figure 2 The Map of the Chaoshan Area with Four Cities. Retrieved from: *https://sinastorage.com/storage.caitou.sina.com.cn/products/201609/5a7b62cc099a06f3631cfa64b06457dc.jpeg*

1.2 Hypotheses about the Consonant Endings of the Chaoshan Dialect

There are different hypotheses for the situation of consonant endings in the modern Chaoshan dialect. These hypotheses are mainly formulated based on the theory that language change is caused by the internal adaptation of the language itself and the premise that consonant endings experience a process of weakening from Middle Chinese to the modern periods. Specifically, the plosive consonant endings [-p] [-t] [-k] in Middle Chinese will merge into each other and change to a glottal plosive ending [-ʔ], and then vanish into opening ending finally; while the nasal consonant endings [-m] [-n] [-ŋ] will merge and become a nasalized feature of the preceding vowel and then disappear in the

end.[4] However, some questions are remaining unanswered according to current researches.

Some scholars recognize the glottal plosive ending [-ʔ] as a transition from the plosive consonant ending to the loss of consonant endings, and the nasalized final [˜] as the marker of loss of the nasal consonant endings [-m], [-n], [-ŋ] which causes vowel nasalization. It means that when the original nasal consonant endings vanished, the nasalized function of these endings for the preceding vowels was still preserved in the vowels, and these vowels are nasalized vowels marked with the symbol [˜]. Wang Li suggests that the loss of a plosive consonant ending must experience the combination of [-p], [-t], [-k] into the glottal plosive ending [-ʔ] (Wang 1985: 542). Moreover, he indicates that most of the nasalized finals in the Chaoshan dialect come from the loss of nasal consonant endings [-m], [-n], [-ŋ] (Wang 1936: 671). Zhan (1981: 39) shows that the origin of the nasalized final [˜] can be either [-n] or [-ŋ], and most of the literal readings that have a nasal consonant ending change the consonant ending to a nasalized final [˜] in colloquial readings.

Chen Peiying (2015: 114) proposes an order for the change of the plosive consonant endings of the Chaoshan dialect as [-p/-t/-k] → [-p/-k] → [-k], which suggests that in the Chaoshan dialect, there are three plosive consonant endings [-p], [-t], [-k] initially, then the ending [-t] disappeared first after merging with [-p] and [-k], and then [-p] vanished with only one plosive consonant ending [-k] left. Then, all of the consonant endings merge into the glottal plosive ending [-ʔ] and finally disappear. It is assumed that

[4] The nasalization function of the preceding vowels is marked with the notation [˜] in this paper.

due to the imbalance of phonological evolution, the characters having a higher speed of evolution would change their initial consonant ending into [-ʔ] first, while the characters changing in a lower speed still keep the original consonant endings at this stage, which results in the variance of plosive consonant endings in different subgroups of Chaoshan dialect. According to Chen's hypothesis, Chenghai, which only preserves one plosive consonant ending from Middle Chinese is the remotest from Middle Chinese, hence is at the third stage of evolution. Haifeng whose consonant ending system is close to Middle Chinese is at the first stage, while Shantou, Chaozhou, and Jieyang are in the middle stage.

Zheng Weina (2012) proposed that three endings of *Rusheng* (entering tone) syllables [-p], [-t], [-k] in Middle Chinese are weakened into a plosive glottal stop [-ʔ] or an opening ending [-0] in the South Min dialect. Since [-ʔ] can only be found in colloquial readings and generally shows in Rime groups[5] Xian 咸, Shan 山, Dang 宕, Geng 梗, Jiang 江" and rarely present in the Rime groups "Shen 深, Zhen 臻, Tong 通, Zeng 曾", Zheng suggests that "the emerge of the weakening coda [-ʔ] may be caused by the historic dichotomy of the long and short vowels" (Zheng 2012: 53).

5 "Rime group" refers to She 摄 or Yunshe 韵摄 in Chinese, which first appeared in a rhyme table called *Sisheng Dengzi* 四声等子 in the twelfth century. In the *Sisheng Dengzi* 四声等子, all the thymes of *Qieyun* 切韵, the earliest surviving rhyme dictionary that was published in 601, are classified into sixteen rime groups, according to their vowels and endings. The term "Rime group" means an aggregation or collection of the thymes that have the same vowels and endings in the rhyme tables. Sixteen rime groups include 通，江，止，遇，蟹，臻，山，效，果，假，宕，梗，曾，流，深，咸. Among these rime groups, 深 and 咸 have a plosive consonant ending [-p] or a nasal consonant ending [-m], and 臻 and 山 have a plosive consonant ending [-t] or a nasal consonant ending [-n], and 宕，梗，曾，通，江 have a plosive consonant ending [-k] or a nasal consonant ending [-ŋ].

Li Yongming (1986: 47) indicates that the change of the plosive consonant endings of the Chaoshan dialect was induced by the change of the nasal consonant endings with the change of the plosive consonant ending [-p], [-t], [-k], [-ʔ] corresponding to the change of the nasal consonant ending and nasalization [-m], [-n], [-ŋ], [˜], and the change of the nasal consonant endings is caused by the change of the number of vowels. According to Li, when the number of vowels increases, there would be no sufficient space to hold a nasal consonant ending in the syllable, therefore the original nasal ending [-n] was leveled out and at the same time, the preceding vowel became nasalized [˜]. Corresponding to this change, the plosive ending [-t] changed to [-ʔ]. When the number of vowels decreases, the weight of the ending becomes heavier, hence the nasal [-n] extends and changes to [-ŋ]. To fit this change, the plosive ending [-t] changes to [-k]. As for the situation that most of the characters that have a plosive ending [-p] in Chaozhou turn to have another ending [-k] instead of the glottal plosive ending [-ʔ], Li gives an explanation that it is caused by the fact that all of the corresponding nasal ending [-m] switched to [-n] rather than a nasalized final [˜] because [-m] is closer to [-n] than to [˜] (Li 1986: 49).

The hypotheses above are all based on the traditional theory of sound change in historical linguistics. One basic assumption of this theory is that sound change is regular, and regular changes happen generally and uniformly regardless of the phonetic circumstances (Campbell 2013: 15). Under the influence of this assumption, previous studies consider the development of the consonant endings in the Chaoshan dialect as a process of gradually weakening, and the changes of the consonant endings are resulted from the changes of the language itself without being affected by external factors.

However, this theory which recognized phonetic change as a regular process that can be described with common linguistic law cannot spell out the variation of the consonant endings among different subgroups of the Chaoshan dialect, namely there are two plosive consonant endings in Chenghai, four plosive consonant endings in Haifeng, and three in Shantou, Chaozhou, and Jieyang under the same linguistic law and within the language structure itself without considering other external factors. Therefore, more reasonable explanations for the situation of consonant endings in the modern Chaoshan dialect, especially for the variation of the consonant endings among five subgroups of the Chaoshan dialect should be provided and analyzed.

1.3 Theoretical Framework

Shen (2007) indicated that one important defect of traditional historical linguistics is that they only consider the inner elements of a language and disregard external factors. He suggests that the plosive and nasal consonant endings did not exist in the old Min dialect systematically before the literal reading system was borrowing, otherwise, we cannot explain how these consonant endings lost after the emergence of the literal reading system. Besides, the appearance of the nasalized consonant ending [˜] and the glottal stop ending [-ʔ] in the South Min dialect is a result of language shift. Similarly, Liu (2009: 117) regards the plosive consonant endings in the Chaoshan dialect as a double-leveled system based on language borrowing. The previous level involves the merging of [-p], [-t], [-k] into [-ʔ], with some glottal plosive ending [-ʔ] disappeared later. The second level includes borrowing the consonant endings [-p], [-t], [-k] from prestige dialects into the literal reading system of the Chaoshan dialect. Involving these two levels

overlapping in the phonological system results in the existence of four plosive consonant endings in the Chaoshan dialect, that is, [-p], [-t], [-k] and [-ʔ]. The presence of the plosive consonant endings of the Chaoshan dialect is formed based on these four endings and the interaction of the literal and colloquial reading systems.

According to Shen (2016: 42), the basic mechanism for dialect formation is language shift. With the spreading of the Han culture and the migration of population from central plains to southern China, the aboriginals of southern China gradually give up their native language and turn to speak the Han Chinese which was recognized as a prestige language when they came into contact with people from the central plains. Then when a new prestige language penetrates this area, another language shift might happen between the new arrival language with language that has already existed in this region (Shen 2016: 43). As for which features will be preserved, and which features would be lost, it largely depends on the structure of the population who speaks different languages in a contact situation.

Sarah Thomason and Terrence Kaufman (1992: 3-4) suggest that languages are the product of communication among speakers, which cannot be thoroughly studied within the purely linguistic structure without considering the social context in which it is embedded. And the primary determinant of the outcome of language contact is the sociolinguistic factors rather than the purely linguistic considerations which will not work when it comes to determining what can happen to a language as a result of outside factors (Thomason and Kaufman 1992: 13, 35). Thus, the emergence of mixed languages in language contact situations "do not fit within the genetic model and therefore cannot be classified genetically at all" (Thomason and Kaufman 1992: 3).

CHAPTER 2

INTER-GROUP VARIATION OF THE CONSONANT ENDINGS WITHIN THE CHAOSHAN DIALECT

In Middle Chinese, there are three plosive consonant endings [-p], [-t], [-k] and three nasal consonant endings [-m], [-n], [-ŋ], all of which are perfectly maintained in the modern Cantonese. While in modern Chaoshan dialect, most of the alveolar endings [-t] and [-n] are lost, and another two endings come out, that is the glottal plosive ending [-ʔ] and the nasalized final [˜] ([˜] functions as nasalization of the preceding vowel, such as 三[sã], 敢[kã], 鲜[tsʰĩ], 圆[ĩ] in Shantou dialect).

The preservation of the plosive and nasal consonant endings in colloquial reading varies among five major subgroups of the Chaoshan dialect as shown in Table 1. In Haifeng, all of the six consonant endings in Middle Chinese can be found, while in Shantou, Chaozhou, and Jieyang, the plosive consonant ending [-t] and the nasal consonant ending [-n] are missing, and in Chenghai, only the plosive consonant ending[-k] and the nasal consonant ending [-ŋ] are retained.

Most of the current research on the consonant endings of the Chaoshan dialect is qualitative. They are mainly based on either the descriptive diachronic comparison between Middle Chinese and the modern Chaoshan dialect or the illustrative synchronic comparison among different subgroups of the Chaoshan dialect. As shown in Table 1, these comparisons are done only among a small sample of representative characters.

Table 1 Comparison of the Consonant Endings in Middle Chinese and Modern Chaoshan Dialect

Subgroup of Chaoshan dialect	Plosive consonant ending with example characters		Nasal consonant ending with example characters	
Middle Chinese[6]	[-p] [-t] [-k]	答[təp] 杂[dzəp] 失[ɕit] 日[ɲit] 特[dək] 测[tʂʰik]	[-m] [-n] [-ŋ]	甜[dem] 南[nəm] 丹[tɑn] 因[ʔin] 唐[dɑŋ]张[ʈiɐŋ]
Chaozhou 潮州	[-p] [-k] [-ʔ]	答[tap] 杂[tsap] 特[tek] 测[tsʰek] 割[kuaʔ] 格[keʔ]	[-m] [-ŋ] [˜]	甜[tiem] 南[nam] 慢[maŋ] 丹[taŋ] 敢[kã] 殿[toĩ]
Shantou 汕头	[-p] [-k] [-ʔ]	答[tap] 杂[tsap] 特[tek] 测[tsʰek] 割[kuaʔ] 格[keʔ]	[-m] [-ŋ] [˜]	甜[tiam] 南[nam] 慢[maŋ] 丹[taŋ] 敢[kã] 殿[toĩ]
Jieyang 揭阳	[-p] [-k] [-ʔ]	答[tap] 杂[tsap] 特[tek] 测[tsʰek] 割[kuaʔ] 格[keʔ]	[-m] [-ŋ] [˜]	甜[tiam] 南[nam] 慢[maŋ] 丹[taŋ] 敢[kã] 殿[taĩ]
Chenghai 澄海	[-k] [-ʔ]	答[tak] 杂[tsak] 割[kuaʔ] 格[keʔ]	[-ŋ] [˜]	甜[tiaŋ] 南[naŋ] 敢[kã] 殿[toĩ]
Haifeng 海丰	[-p] [-t] [-k] [-ʔ]	答[tap] 杂[tsap] 失[sit]日[zit] 特[tek] 测[tsʰek] 割[kuaʔ] 格[keʔ]	[-m] [-n] [-ŋ] [˜]	甜[tiam] 南[nam] 因[in] 尊[tsun] 慢[maŋ] 丹[taŋ] 先[saĩ] 尝[siẽ]

In this chapter, I conduct a quantitative analysis of the consonant endings among five subgroups of the Chaoshan dialect, which could not only show that the consonant endings vary among different subgroups but also quantify how different they are from each other on a numerical scale. Specifically, I construct a measure of distance based on

6 The syllables of the example characters in Middle Chinese are reconstituted by Pan Wuyun 潘悟云 from 韵典网 https://ytenx.org/.

the present and absence of common consonant endings among a large sample of characters. The measure is used to calculate the degree of difference of their endings among different modern dialects or different subgroups of a dialect synchronically, and also to explore the change of their endings from Middle Chinese to modern dialects diachronically.

In section 2.1, I first introduce the source materials and methodology for measuring the distance of consonant endings among subgroups or dialects. Section 2.3 reports the synchronic variance of the consonant endings among five Chaoshan subgroups. Section 2.4 shows the diachronic change of six consonant endings from Middle Chinese to modern Chaoshan dialect and from the Chaozhou dialect in the 19th century to modern Chaozhou dialect.

2.1 Source Materials and Methodology

2.1.1 Data sources and samples

There are three sources of the phonetic data used in my research. The first one is *Hanyu Fangyin Zihui* (汉语方音字汇), a collection of characters with phonology of Middle Chinese and different dialects including Hakka dialect in Meixian, the South Min dialect in Xiamen and Chaozhou as a representative subgroup of the Chaoshan dialect.

The second one is the *Handbook of the Swatow Vernacular* 汕头话读本, a textbook published in 1886, which records the vernacular of the Chaozhou dialect in the late 19th century and has been used in related research. Huang (2017) described the phonology system of the Chaozhou dialect in the 19th century by collecting and

reorganizing the homophony syllabary in the handbook, which will be used in my research.

The last one is *Chinese Character Readings* (汉字古今音资料库, CCR), a dialect database developed by the Institute of Information Science, Academia Sinica and National Taiwan University in 2011. It records the pronunciation of more than 20,000 characters both in Middle Chinese and in modern Chinese dialects.[7]

Based on the availability of phonetic data, I construct two samples of characters. The first sample consists of 911 characters, including 264 characters having a plosive ending and 647 characters having a nasal ending in Middle Chinese. It is constructed as follows. I first collect all the characters whose syllables contain a plosive or a nasal consonant ending in Middle Chinese in the *Hanyu Fangyin Zihui* (汉语方音字汇). In total there are 1704 characters either with a plosive consonant ending (471) or a nasal consonant ending (1233) in Middle Chinese. Then I extract the phonetic information of these characters from CCR, and only 911 of them whose phonetic information in modern Chaoshan are recorded. In this way I obtain a sample of 911 characters with the phonetic information in Middle Chinese, Hakka, Xiamen and five subgroups of Chaoshan. In this sample, 264 characters have plosive endings in Middle Chinese and 647 characters have nasal endings in Middle Chinese.

The second sample that will be used in the comparison with Chaozhou in the 19th century is constructed in the same way. It consists of 843 characters from the *Handbook*

7 The recordings of the phonology of the Chaoshan dialect in Shantou, Chaozhou, Chenghai, Jieyang, and Haifeng in this database are based on *Guangdong Min Fangyan Yuyin Yanjiu* written by Lin Lunlun and Chen Xiaofeng (2015) and *Chenghai Fangyan Yanjiu* by Lin Lunlun (1996).

of the Swatow Vernacular 汕头话读本 that are also recorded in CCR. In this sample, 238 characters have plosive endings and 605 have nasal endings.

As we can see, the samples are not balanced in the sense that the number of characters with plosive ending is far different from that of those with nasal endings. To avoid possible bias, I divide each sample into different groups based on the phonetic features which allow me to measure the distance in terms of each feature between two dialects. For example, 911 characters in the first sample are divided into two big groups — one consists of 264 characters with plosive endings in Middle Chinese and another contains 647 characters with nasal endings in Middle Chinese. Group 1 is divided into three small groups with the ending [-p] [-t] [-k] separately, and Group 2 is also split into three small groups with the ending [-m] [-n] [-ŋ] respectively.

Similarly, 843 characters in the second sample are divided into two large groups. Group 1 consists of 238 characters with plosive consonant endings and group 2 contains 605 characters with nasal consonant endings in 19th Chaozhou. Since there are four plosive consonant endings [-p] [-t] [-k] [-ʔ] and four nasal consonant endings [-m] [-n] [-ŋ] [˜] in Chaozhou dialect in the 19th century, characters in group 1 are further divided into four small groups with ending [-p] [-t] [-k] and [-ʔ] separately, and characters in group 2 are also grouped together if they have the same ending, [-m] [-n] [-ŋ] or [˜].

In summary, I collect two samples of characters and divide each sample into different groups, with the characters in each group share the same phonetic feature in either Middle Chinese or the19th Chaozhou, as shown in Table 2.

Table 2 The Composition of Samples

		Sample 1	Sample 2
Plosive endings	[-p]	45	28
	[-t]	87	47
	[-k]	132	64
	[-ʔ]		99
Nasal endings	[-m]	84	63
	[-n]	273	176
	[-ŋ]	291	168
	[̃]		198
Total		**911**	**843**

2.1.2 The correlation coefficient

We measure the distance between two dialects in reference to some phonetic features by the correlation coefficient, or more precisely, one subtracting the correlation coefficient. The correlation coefficient between dialect A and dialect B in reference to a phonetic feature is calculated in the following steps.

First, for each character in a small group, assign number 1 if it has the same ending in both dialects and 0 otherwise. Then calculate the average of the assigned numbers as the correlation coefficient in reference to that small group. Finally, take the average of those coefficients in all small groups in the category corresponding to the phonetic feature.

For example, to find the correlation coefficient between two dialects in reference to each plosive consonant ending using sample 1, we first assign a value to each character in the three small groups corresponding to the ending [-p], [-t] and [-k], and calculate the average of the assigned values, i.e.,

$$C_p = V_p/N_p$$
$$C_t = V_t/N_t$$
$$C_k = V_k/N_k$$

where V_p, V_t, and V_k are the total value assigned to the characters having a endings [-p] [-t] [-k] in Middle Chinese respectively, and as shown in Table 2, $N_p = 45$, $N_t = 87$, and $N_k = 132$ are the total numbers of characters in each small group.

If we would like to measure the relationship of plosive consonant endings between two dialects, then take every small group as an equal component and calculate the average of three coefficients of plosive endings as the final coefficient between the two, i.e.,

$$C = (C_p + C_t + C_k)/3$$

After all the correlation coefficients are computed, we carry out a cluster analysis to generate a relation tree, which presents the relation among dialects graphically. A cluster analysis of coefficients is a way to express degrees of relatedness among dialects which would produce an affinity tree that is displayed on a numerical scale ranging from 0 to 1 (Zheng 1999: 229). The average linking method is adopted following Zheng (1999: 241). The results are presented in the following sections.

2.2 Synchronic Variation within Chaoshan Dialect

To measure the synchronic variation of consonant ending among the five subgroups in modern Chaoshan dialect, I use the first sample of characters collected from *Hanyu Fangyin Zihui* and CCR to calculate the correlation coefficients of three plosive endings [-p] [-t] [-k] and three nasal endings [-m] [-n] [-ŋ] respectively.

As shown in Table 3 and Table 4, the correlation coefficients of the endings [-p] and [-m] among the subgroups other than Chenghai are close to 1, which means most of the characters that have a plosive consonant ending [-p] or a nasal consonant ending [-m] in Middle Chinese have the same ending in these subgroups. While in Chenghai, only around 35% of the characters with plosive consonant ending [-p] in Middle Chinese and no more than 6% of the characters with a nasal consonant ending [-m] in Middle Chinese have the same ending with other subgroups.

Table 3 Coefficients of the plosive ending [-p] among five Chaoshan subgroups

[-p]	Chaozhou	Jieyang	Chenghai	Shantou
Jieyang	1			
Chenghai	.356	.356		
Shantou	1	1	.356	
Haifeng	.956	.956	.311	.956

Table 4 Coefficients of the nasal ending [-m] among five Chaoshan subgroups

[-m]	Chaozhou	Jieyang	Chenghai	Shantou
Jieyang	.988			
Chenghai	.060	.060		
Shantou	1	.988	.060	
Haifeng	.952	.940	.024	.952

Table 5 Coefficients of the plosive ending [-t] among five Chaoshan subgroups

[-t]	Chaozhou	Jieyang	Chenghai	Shantou
Jieyang	.989			
Chenghai	.885	.885		
Shantou	.977	.966	.897	
Haifeng	.575	.563	.506	.563

Table 6 Coefficients of the nasal ending [-n] among five Chaoshan subgroups

[-n]	Chaozhou	Jieyang	Chenghai	Shantou
Jieyang	.963			
Chenghai	.938	.960		
Shantou	.960	.982	.960	
Haifeng	.575	.597	.597	.593

Table 5 and Table 6 show that the endings [-t] and [-n] in Haifeng are the remotest from other subgroups. Only about 60% of all the characters with these two consonant endings in the Middle Chinese share the same ending with other subgroups in modern Chaoshan. In contrast, the coefficients of these two endings among Chaozhou, Jieyang, and Shantou are higher than 0.95, and more than 85% of the characters in Chenghai have the same ending with those in Chaozhou, Jieyang, and Shantou.

Table 7 Coefficients of the plosive ending [-k] among five Chaoshan subgroups

[-k]	Chaozhou	Jieyang	Chenghai	Shantou
Jieyang	1			
Chenghai	.962	.962		
Shantou	.992	.992	.970	
Haifeng	.902	.902	.864	.894

Table 8 Coefficients of the nasal ending [-ŋ] among five Chaoshan subgroups

[-ŋ]	Chaozhou	Jieyang	Chenghai	Shantou
Jieyang	.955			
Chenghai	.928	.931		
Shantou	.969	.959	.945	
Haifeng	.924	.942	.914	.928

From Table 7 and Table 8, it can be seen that the degree of closeness of the plosive ending [-k] among five subgroups is higher than 0.85, and the correlation coefficient of the nasal ending [-ŋ] among these subgroups is higher than 0.90, which shows that most of the characters that have these two endings in Middle Chinese have the same ending in different subgroups of modern Chaoshan dialect.

Table 9 Coefficients of the plosive endings among five Chaoshan subgroups

	Chaozhou	Jieyang	Chenghai	Shantou
Jieyang	.996			
Chenghai	.734	.734		
Shantou	.990	.986	.741	
Haifeng	.811	.807	.560	.804

Table 10 Coefficients of the nasal endings among five Chaoshan subgroups

	Chaozhou	Jieyang	Chenghai	Shantou
Jieyang	.969			
Chenghai	.642	.650		
Shantou	.976	.976	.655	
Haifeng	.817	.826	.512	.824

Table 9 shows the correlation of the plosive endings [-p], [-t] and [-k] overall among the five subgroups, which is graphically presented by the affinity tree in Figure 3.

Table 10 and Figure 4 show the counterpart for the nasal endings.

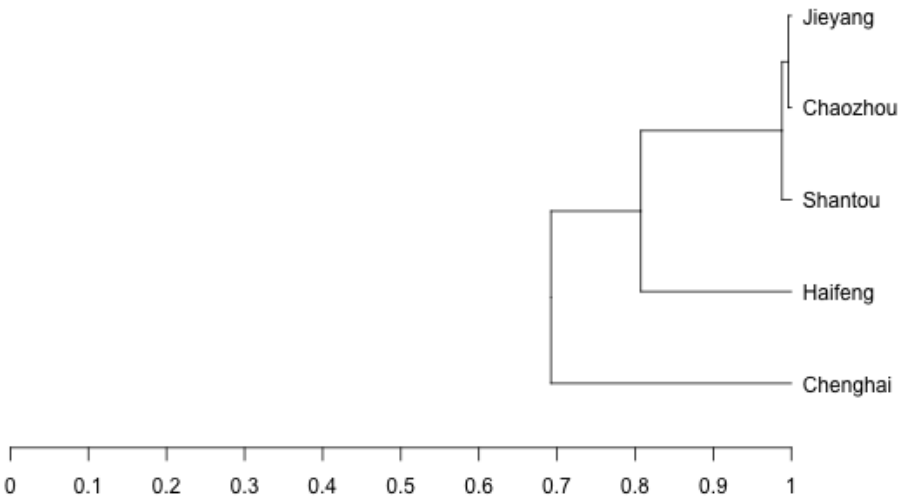

Figure 3 Cluster analysis of the plosive endings among five Chaoshan subgroups

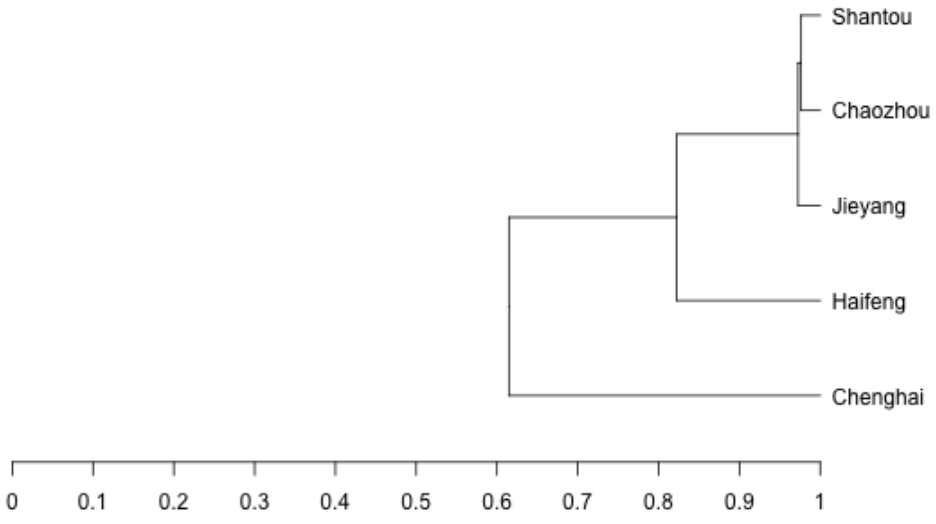

Figure 4 Cluster analysis of the nasal endings among five Chaoshan subgroups

According to this result, the correlation coefficients of the consonant endings among Shantou, Chaozhou, and Jieyang are more than 0.9, which indicates that the distance among these three subgroups is very close. However, the consonant endings in Chenghai is the most different from those in other subgroups. The coefficient of plosive consonant endings between Chenghai and other subgroups ranges from 0.5 to 0.75, and the coefficient of nasal consonant endings ranges from 0.5 to 0.65. The relation between Haifeng and other subgroups is the second remote, the correlation coefficient of which ranges from 0.5 to 0.85.

In summary, we have the following observations.

1) The consonant ending system in Shantou, Chaozhou, and Jieyang are very close to each other.
2) Chenghai is remotest from other subgroups due to the high degree of variation of the endings [-p] and [-m] between Chenghai and other subgroups.
3) Haifeng is different from other subgroups in the endings [-t] and [-n].

2.3 Diachronic Variation in the Chaoshan dialect

2.3.1 Change of the consonant endings from MC to modern Chaoshan dialect

In Middle Chinese, there are three plosive consonant endings [-p] [-t] [-k] and three nasal consonant endings [-m] [-n] [-ŋ]. In the modern Chaoshan dialect, these six consonant endings still exist in Haifeng, while the endings [-t] and [-n] disappeared in other subgroups. In Chenghai, only the endings [-k] and [-ŋ] are preserved, and in Shantou, Jieyang, and Chaozhou, there are two plosive endings [-p] [-k] and two nasal endings [-m] [-ŋ] appearing. Table 11 and Table 12 show the coefficients of each

consonant ending between Middle Chinese and five subgroups of modern Chaoshan dialect.

Table 11 Correlation of the plosive endings between MC and five Chaoshan subgroups

Coefficient of plosive endings		Chaozhou	Jieyang	Chenghai	Shantou	Haifeng
Middle Chinese	[-p]	.644	.644	.000	.644	.667
	[-t]	.000	.000	.000	.000	.276
	[-k]	.614	.614	.636	.606	.614
	average	.419	.419	.216	.417	.519

Table 12 Correlation of the nasal endings between MC and five Chaoshan subgroups

Coefficient of nasal endings		Chaozhou	Jieyang	Chenghai	Shantou	Haifeng
Middle Chinese	[-m]	.880	.892	.000	.880	.928
	[-n]	.000	.000	.000	.000	.278
	[-ŋ]	.746	.742	.766	.756	.746
	average	.542	.545	.255	.545	.651

According to this result, among the five subgroups of the Chaoshan dialect, the distance of consonant endings, including plosive and nasal consonant endings, between Chaoshan dialect in Haifeng and Middle Chinese is the closest, and the relationship between Chenghai and Middle Chinese is the remotest, while the degree of closeness between Shantou, Chaozhou, Jieyang and Middle Chinese are very similar and in the middle. The nasal consonant endings are better preserved than the plosive consonant

endings from Middle Chinese to the modern Chaoshan dialect. This can be confirmed in Figure 5 which shows the ratio of the change in consonant endings from Middle Chinese to modern Chaoshan.

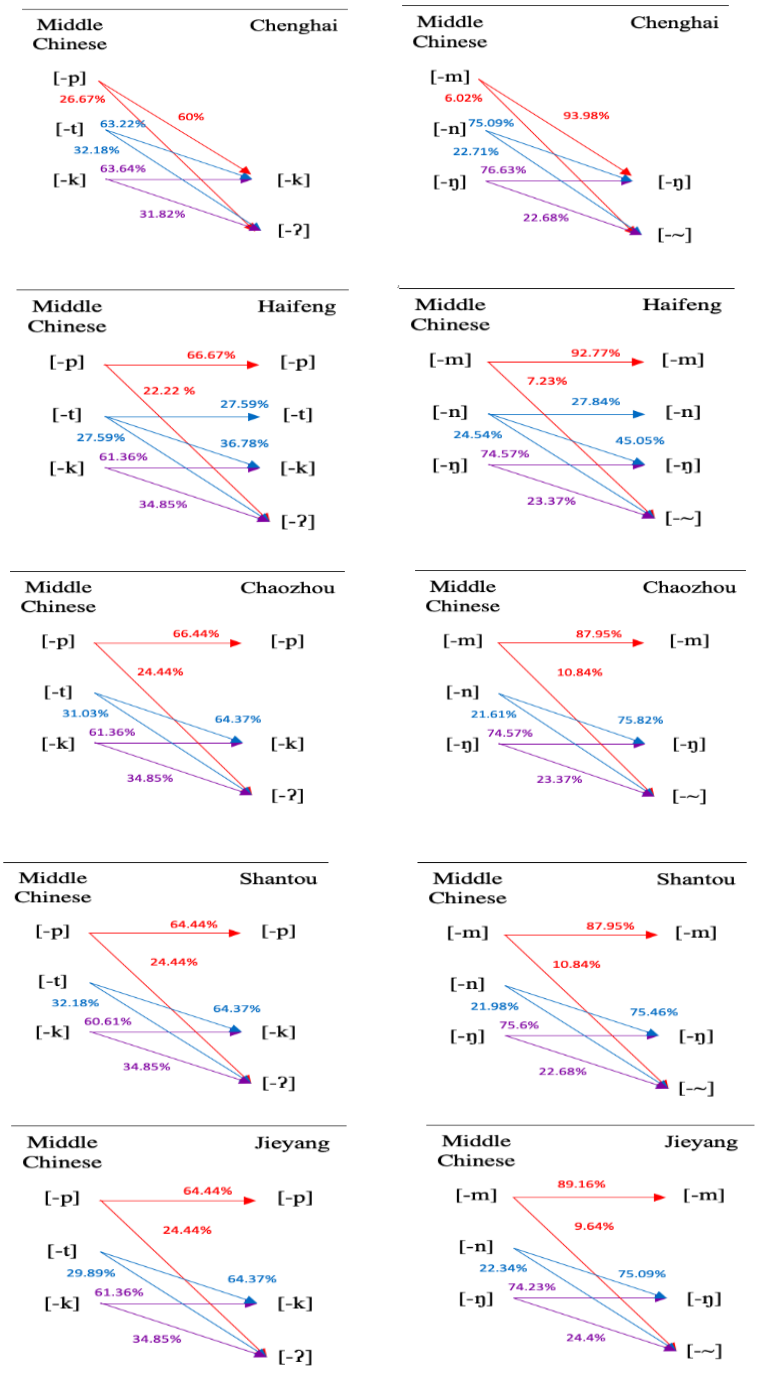

Figure 5 Ratio of the Change in Consonant Endings from Middle Chinese to Five Chaoshan Subgroups

2.3.2 Change of the consonant endings from the 19th century to modern Chaoshan dialect

We calculated the distance of the consonant endings between the Chaozhou dialect in the late 19th century and five modern Chaoshan subgroups by tabulating the endings of 843 characters mentioned in Section 2.1.1 and comparing them with the endings in modern Chaoshan subgroups.

Table 13 Change of the plosive endings from the 19th century to modern Chaoshan dialect

19th Century	Chaozhou	Shantou	Jieyang	Chenghai	Haifeng
[-p]	.885	.800	.850	.000	.857
[-t]	.000	.000	.000	.000	.333
[-k]	.922	.898	.898	.952	.875
[-ʔ]	.808	.821	.808	.750	.740
Average	.654	.630	.639	.425	.701

Table 14 Change of the nasal endings from the 19th century to modern Chaoshan dialect

19th Century	Chaozhou	Shantou	Jieyang	Chenghai	Haifeng
[-m]	.937	.915	.936	.000	.957
[-n]	.000	.000	.000	.000	.333
[-ŋ]	.958	.967	.967	.987	.967
[˜]	.898	.833	.825	.797	.725
Average	.698	.679	.682	.446	.746

The correlation of the consonant endings between the Chaozhou dialect in the 19th century and modern Haifeng dialect is the closest, and the relation between the Chaozhou dialect in the 19th century and modern Chenghai dialect is the remotest. While the degree of change from the Chaozhou dialect in the 19th century to modern Shantou, Chaozhou, and Jieyang is very close and in the middle.

In the late 19th century, three plosive and three nasal consonant endings from Middle Chinese are preserved in the Chaozhou dialect. Also, the glottal stop ending [-ʔ] came out and the nasalized final [̃] emerged. From the 19th century to modern times, for the characters that have the plosive consonant endings [-k] [-ʔ] or the nasal consonant endings [-ŋ] [̃], their endings are highly consistent with those in five modern Chaoshan subgroups. The endings [-p] and [-m] are also well preserved in Shantou, Chaozhou, Jieyang, and Haifeng, but disappeared in Chenghai. And the endings [-t] and [-n] only present in Haifeng.

CHAPTER 3

LIMITATIONS OF THE WEAKENING HYPOTHESIS

Too many anomalies are a sign that the existing paradigm might be in crisis (Kuhn 1962). In this chapter, I present some exceptions that cannot be explained by the prevailing hypothesis of weakening in the existing literature.

3.1 Irregular change of the Consonant Endings in Chaoshan Dialect

According to the weakening hypothesis, the evolution of the consonant endings in the Chaoshan dialect is a process of weakening governed by some regular rules. For example, Chen (2015) proposes that the endings evolve by stages, namely [-p/-t/-k] → [-p/-k] → [-k], and then become a plosive stop [-ʔ] and finally disappear. According to this theory, Haifeng is in the first stage of evolution, Shantou, Chaozhou and Jieyang are in the second stage, and Chenghai is in the third stage. If so, then the ending [-k] as the last one to survive should be best preserved in modern Chaoshan dialect. However, I find that the correlation coefficient of the ending [-p] between Middle Chinese and modern Chaoshan dialect is higher than the ending [-k] except Chenghai as shown in Table 11, which implies that the consonant ending [-p] is better preserved than [-k].

Moreover, in Shantou, Chaozhou, Jieyang and Haifeng, ending [-p] is preserved in about 65% of the characters, near 25% of them change to [-ʔ] and the rest disappear at all, but none of them change their ending from [-p] to [-k], which is another abnormality to the three-stage evolutionary hypothesis.

Other efforts to discover the underlying rules include the attempts to connect the change of the consonant endings with phonetic features such as the number or length of

the main vowel (e.g., Li 1986; Zheng 2012). However, as shown in Table 15, it is easy to find exceptional cases that cannot be explained by these *ad hoc* theories.

Table 15 Finals and example characters under the change of the nasal endings from MC to modern Chaoshan dialect

Nasal ending from Middle Chinese to modern Chaoshan dialect	Final	Characters
[-m] → [˜]	[-ã] (five subgroups)	担（担任）担（挑担）篮参三衫柑敢
[-n] → [˜]	[-oĩ] (Chaozhou, Chenghai, Shantou)	斑板办反拣千前先闲
	[-aĩ] (Jieyang, Haifeng)	
	[-uã] (five subgroups)	般半伴潘盘瞒单弹摊炭烂散（松散）散（解散）盏产山肝寒旱安鞍案贱欢还碗泉
	[-ĩ] (five subgroups)	缠扇扁辫片棉年箭见钱献弦砚燕圆院
	[-uĩ] (five subgroups)	县
	[-uẽ] (five subgroups)	关
[-ŋ] → [˜]	[-iã] (five subgroups)	件聘正（正月）整正（公正）成（成功）城声冰兵丙饼命定厅领京镜情请行（行为）赢营影兄
	[-iẽ] (Chaozhou, Chenghai)	张章帐胀尝伤赏上让娘（新娘）梁量（量米）两（斤两）蒋酱枪腔墙相（相互）箱香乡想相（相貌）像象羊杨
	[-iõ] (Jieyang, Shantou, Haifeng)	
	[-ẽ] (five subgroups)	彭棚郑生省（节省）更（打更）庚耕坑柄病平井青省（反省）醒性姓

In these examples, [-a] is a low main vowel, [-e] and [-o] are mid-high vowels, and [-i] is a high vowel. There is no evident supporting the hypothesis that the emergence of the nasalization final is close related with the length of the vowels or the vowel

number. The linguistic laws they proposed cannot describe all the changes of the consonant endings among different subgroups and cannot explain the exceptional situations. Not all the characters that are organized in the same Rime groups in Middle Chinese or have the same vowel experienced consistent change of their endings.

3.2 Reverse of the Consonant Endings from the 19th Century to Modern Time

From the perspective of historical linguistics, mergers are irreversible, which means that "when sounds have completely merged, a subsequent change, say some generations later, will not be able to restore the original distinctions" (Campbell, 2013, p18). The hypothesis of weakening follows this tradition. Its advocators believe that plosive consonant endings [-p] [-t] [-k] weakened and merged into a glottal stop [-ʔ] and the nasal consonant endings [-m] [-n] [-ŋ] weakened and merged into a nasalized final [˜] (e.g., Zhan 1981, Wang 1936).

Table 16 Example characters for the change of the ending from [-ʔ] [˜] in the Chaozhou dialect in the 19th to [-k] [-ŋ] in modern Chaozhou dialect

character	Ending in 19th century Chaozhou	Ending in modern Chaozhou
肉 脊 织 翼 越 角 骆 束 各 失 洁 忽 乞	[-ʔ]	[-k]
邦 併 黄 睛	[˜]	[-ŋ]

However, I find that there are some characters with weakened plosive ending [-ʔ] or a nasalized final [˜] in the 19th century Chaozhou turning to have the plosive consonant ending [-k] or the nasal consonant ending [-ŋ] in modern Chaozhou dialect as

shown in Table 16. If the endings [-ʔ] and [˜] as a result of merging from [-p] [-t] [-k] and [-m] [-n] [-ŋ], and this process is irreversible, then we cannot explain the reversal.

I suggest that this situation results from the horizontal transmission between individuals speaking the Chaozhou dialect and those speaking other dialects where these characters have other consonant endings other than [-ʔ] and [˜] during the last more than one hundred years. When individuals who speak the Chaoshan dialect get into contact with people who speak other prestige dialects, the consonant endings [-p] [-t] [-k] and [-m] [-n] [-ŋ] might be reintroduced into the Chaoshan dialect even after these endings have merged into the weakening endings [-ʔ] and [˜], and language shift might happen in this process. On the contrary, historical linguistics considers the mergers as irreversible, which means the original distinctions of sounds cannot be restored after they are merged (Compbell 2013: 18).

3.3 The high Correlation between Modern Xiamen Dialect and Chaozhou Dialect in the 19th century

There are four plosive consonant endings [-p] [-t] [-k] [-ʔ] and four nasal consonant endings [-m] [-n] [-ŋ] [˜] in both modern Xiamen dialect and Chaozhou dialect in the late 19th century. After making a comparison of the consonant endings between this pair of dialects, we found that the correlation between them is much closer than the relation between modern Chaoshan dialect and Chaozhou dialect in 19th century as shown in Table 17 and Table 18.

There are 843 characters having consonant endings in the Chaozhou dialect in the late 19th century collected in *A Handbook of the Swatow Vernacular*. After dividing these characters into eight small groups based on their consonant endings, we calculate

the correlation coefficient among the Chaozhou dialect in the19th century and five subgroups of modern Chaoshan dialect and modern Xiamen dialect according to the presence and absence of common endings in each group, then take the mean of the sum of four coefficients of the plosive consonant endings as the final coefficient of plosive endings and the average of the sum of four coefficients of the nasal consonant endings as the final coefficient of nasal ending.

Table 17 Correlation of the plosive consonant endings between the Chaoshan dialect in the 19th century and modern Chaoshan and modern Xiamen dialect

Handbook	Chaozhou	Shantou	Jieyang	Chenghai	Haifeng	Xiamen
[-p]	.885	.800	.850	.000	.857	.929
[-t]	.000	.000	.000	.000	.333	.872
[-k]	.922	.898	.898	.952	.875	.922
[-ʔ]	.808	.821	.808	.750	.740	.796
Average	.654	.630	.639	.425	.701	.880

Table 18 Correlation of the nasal consonant endings between the Chaoshan dialect in the 19th century and modern Chaoshan and modern Xiamen dialect

Handbook	Chaozhou	Shantou	Jieyang	Chenghai	Haifeng	Xiamen
[-m]	.937	.915	.936	.000	.957	.919
[-n]	.000	.000	.000	.000	.333	.955
[-ŋ]	.958	.967	.967	.987	.967	.916
[˜]	.898	.833	.825	.797	.725	.738
Average	.698	.679	.682	.446	.746	.882

The correlation coefficient between modern Xiamen dialect and the Chaozhou dialect in 19th century is higher than 0.80, which indicates that this pair of dialects are much closer related than the relation among the Chaozhou dialect in 19th century and five subgroups of modern Chaoshan dialect, the coefficients between which are ranging from 0.425 to 0.75. Especially for the ending [-t] and [-n], they vanished in modern Chaozhou, Shantou, Jieyang, and Chenghai subgroup, and only 33.3% of them are

preserved in modern Haifeng subgroup. On the contrary, for the characters that have an ending [-t] in the Chaozhou dialect in the 19th century, about 87.2% of them still have the same ending in modern Xiamen dialect and for those having an ending [-n] in Chaozhou dialect in the 19th century, around 95.5% of them retained the same ending in modern Xiamen dialect.

According to Johannes Schmidt (1872)'s "wave theory", the longer two languages separated from their central point, the fewer linguistic traits they may share. In other words, the longer two languages were separated from the proto-language in time, the less relevant they may become. Consider that the Chaoshan dialect was independent of other South Min subgroups since the Yuan and Ming dynasties after several waves of the population migrated from Fujian Province, modern Xiamen dialect and Chaoshan dialect have separated for at least 600 years. According to historical linguistics, the Xiamen dialect and Chaoshan dialect are developing independently without any further interaction after their separation, therefore they become more and more different.

However, the degree of closeness between modern Xiamen dialect and Chaozhou dialect in the 19th century is higher than the degree of relativeness between modern Chaozhou dialect and Chaozhou dialect in the 19th century whose distance in times is about 140 years. This situation cannot be reasonably explained with "wave theory". If we consider that languages are changing within their own language structure after they separate from their proto-language, then it is expected that the Chaozhou dialect 100 years ago is much closer to modern Chaoshan dialect than to modern Xiamen dialect. This condition can be reasonably explained with the subsequent contact between the Chaoshan dialect and the Xiamen dialect after the division of the South Min dialect.

Chaozhou dialect in Ming and Qing dynasties is strongly influenced by the coming of the migrants from southern Fujian Province, and the language contact between migrants and the aboriginals resulted in the shape of the Chaoshan dialect at that period.

CHAPTER 4

PERSPECTIVE OF HORIZONTAL TRANSMISSION AND LANGUAGE CONTACT

4.1 Language Contact between Han and Non-Han Chinese

The variance of the consonant endings in different subgroups of the Chaoshan dialect can be better explained with horizontal transmission and language contact between Han and non-Han Chinese. Lin (2015) recognized the substratum of the Chaoshan dialect as a branch of the Zhuang-Dong language. This opinion is also supported by Li (2005) who suggested that the existence of the implosive consonant [ʔb] and [ʔd] in the South Min dialect was affected by Zhuang-Dong language, which happened between Old Chinese and Middle Chinese.

The ancestors of the residents in the Chaoshan area are Zhuang and other non-Han people. Historically, when Han Chinese spread from the north part to the south part of China, it inevitably went through the Miao area (Shen 2007: 123). And since there is no consonant ending in the Miao language, the original consonant endings in the Han Chinese disappeared when it comes into contact with the Miao language during their spreading to the south area (Shen 2007: 123). Therefore, when the Han Chinese arrived in the Chaoshan area, the original consonant endings in this language were weakening and finally disappear in colloquial reading. And the consonant endings in vernacular of the Chaoshan dialect are reintroduced by the emergence of the literal reading system in the Tang and Song dynasties.

As the migrations from central plains to the Chaoshan areas is not a one-time process, but rather a repeating and recurring condition, the language contact between Han

Chinese and non-Han Chinese happened again and again in history. After the migration from central plains occurred, the Han Chinese that migrants brought into the Chaoshan area is considered as a prestige language, and the features of this language has a larger opportunity to survive in the feature pool. Since the people who migrated into different districts of the Chaoshan region are not coming from the same place, hence the language they spoke before they moved to the Chaoshan area is not exactly the same. Moreover, the number of migrants and their population structure are not the same. The variation of the migrants' language and their population structure are significant source for the divergence of the consonant endings among several subgroups of the Chaoshan dialect.

Furthermore, the language that aboriginals were speaking before large scales of migration happened is not without difference within the Chaoshan area, and the numbers of aboriginals in different districts are not equal. For the districts where the population of aboriginals is significantly bigger than other areas, the features of the dialect they were speaking after migration happened to have a larger chance to survive in the contact situation. These factors might cause the variance of the consonant endings among five subgroups of the modern Chaoshan dialect. If we consider a specific subgroup as a feature pool, the languages that migrants and aboriginals speak would determine what features will come into the feature pool, and the construction of the population and other social factors might influence what features will be favored and what features would vanish.

Therefore, the languages that migrants were speaking when they came to different districts of the Chaoshan area and the population structure of migrants and aboriginals are external factors that might influence the formation and the changing of the Chaoshan

dialect, including the consonant ending system. We suggest that the inner variance of the consonant endings within the Chaoshan dialect can be better explained from the perspective of language contact and horizontal transmission, which is the interaction between people who speak Han or non-Han Chinese when they come into contact in the Chaoshan area. Moreover, language contact and horizontal transmission is not a one-time process, but rather a circulation which might happen repeatedly in history, and a specific linguistic feature of a substratum language can survive after several times of language shift (Shen 2007: 120).

4.2 Language Contact between Chaoshan Aborigines and Fujian Migrants

Chaoshan area is located in the northeast part of Guangdong Province that borders southern Fujian Province where the major dialect is South Min dialect and Meizhou where the Hakka dialect is prevailing. Therefore, in order to figure out the cause for the inter-group variation of the consonant endings within modern Chaoshan dialect, it would be beneficial to look into the divergence of the consonant endings between Chaoshan dialect and other neighbor dialects.

Figure 6 and Figure 7 summarize the results of cluster analysis of consonant endings among the Chaoshan dialect and Middle Chinese and other surrounding dialects. It can be seen that the consonant ending system in modern Hakka dialect in Meixian is closer to Middle Chinese than five subgroups of the Chaoshan dialect and Xiamen dialect. This pattern is consistent with the historical fact that the Chaoshan dialect has split from the South Min dialect in Yuan and Ming dynasty after several waves of migration from the central plains and Fujian Province (Lin 1988: 141).

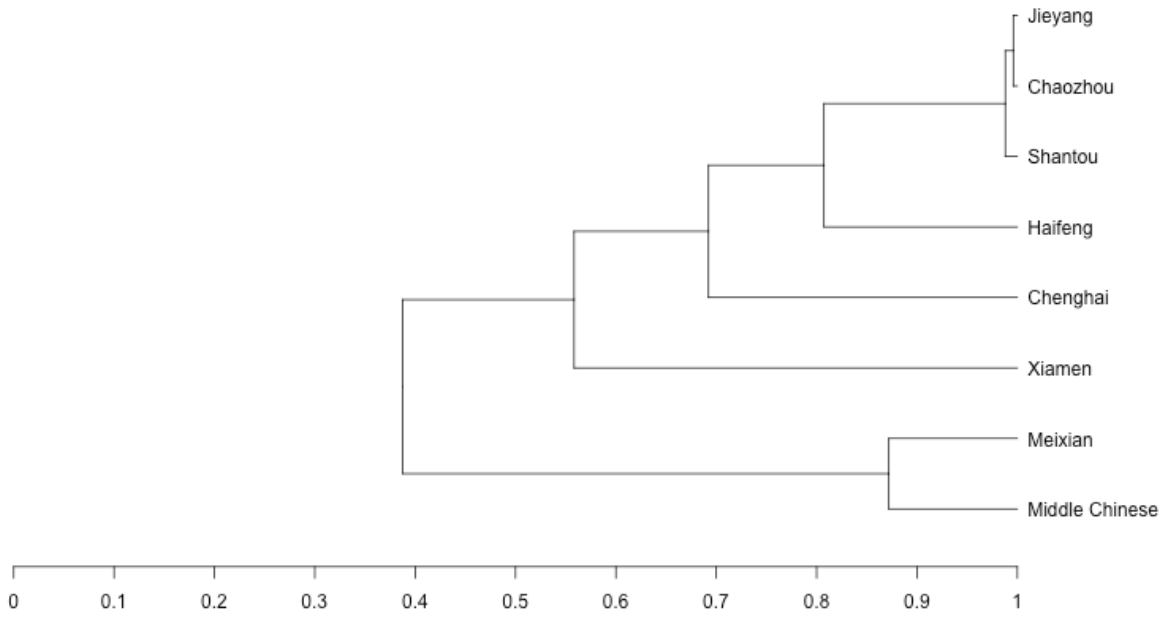

Figure 6 Cluster analysis of the plosive consonant endings among the Chaoshan dialect and Middle Chinese and other surrounding dialects

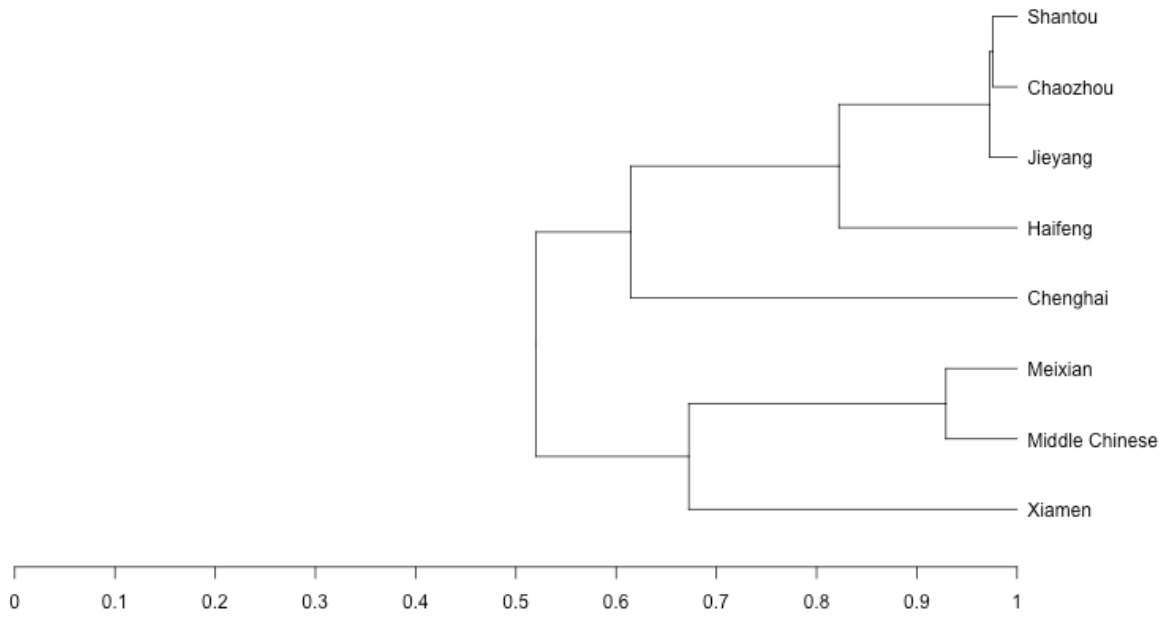

Figure 7 Cluster analysis of the nasal consonant endings among the Chaoshan dialect and Middle Chinese and other surrounding dialects

Moreover, as a result of the relocation order by the government to move the coastal residents into the hinterland in the Qing dynasty, more and more population migrated from south Fujian province to the Chaoshan area (Li 1994). The migrants in the Chaoshan region mainly came from Quanzhou, Zhangzhou, and Putian (Rao 1946).

From the perspective of horizontal transmission and language contact, dialects usually become more alike after groups of people who speak different dialects come into long-term contact (Dodsworth 2017: 332), and the interactional mechanism for language shift in face-to-fact contact situation is linguistic accommodation. Since the migrants from the Fujian province were coming from different areas, and the language they were spoken at that time are not the same.

Also, the scale of migrations in different districts of the Chaoshan area are different. For instance, from 1736 to 1819, the population in Chaozhou increased by about 180 thousand and Jieyang about 313 thousand (Rao 1946: 1183-7). From 1747 to 1819, the population in Chenghai increased by near 61 thousand (Rao 1946: 1195). Since the number of migrants from Fujian province are variant in different Chaoshan district, the linguistic features in the migrants' language have different chance to survive in different Chaoshan subgroups. Therefore, it is the scale of the migrants and the variance of their language that leads to the divergence of the phonetic features in different Chaoshan subgroups, including the consonant endings.

4.3 The Formation of Shantou Dialect as a Result of Horizontal Transmission

As discussed in Section 2.3.2, the Chaoshan dialect experienced a lot of change in the last near one hundred and thirty years. Indeed, one of the most prominent changes is the emergence of a new subgroup in Shantou in the 1950s (Lin 2015) after several waves

of the population migrated from the surrounding areas that were populated by other Chaoshan subgroups, which is also a result of migration-induced language contact and horizontal transmission.

The coefficient of the consonant endings between Shantou and other subgroups is as followed:

Table 19 Coefficient of the consonant endings between Shantou and other subgroups

	Chaozhou	Jieyang	Chenghai	Haifeng
Shantou	.990	.986	.741	.804

The coefficient between Shantou-Chaozhou approaches 1, which indicates that the consonant endings in Shantou and Chaozhou are highly related. There are two plosive consonant endings [-p] [-k] and two nasal consonant endings [-m] [-ŋ] from the Middle Chinese were preserved in both modern Shantou and Chaozhou dialect. Also, the plosive consonant ending [-ʔ] and the nasalized final [˜] present in these two subgroups. Shantou dialect emerged much later than the Chaozhou dialect around in the 1950s under the influence of the migrants from surrounding areas. Besides, Chaozhou dialect is recognized as the representative subgroup of the Chaoshan dialect since Chaozhou is a prefectural city before Shantou developed as the Political, economic and cultural center in the Chaoshan region after 1949 (Li 1994: 266). The significantly close relationship between this pair of dialects can be explained in two ways with the horizontal transmission theory. The first one is that from the beginning of the formation of the Shantou dialect, the consonant endings system in Shantou is closely related to the system in Chaozhou due to the high proportion of the migrants from Chaozhou among the initial migrants and the prestige position of the Chaozhou dialect. The second explanation is that

when the Shantou dialect emerged, the consonant ending system of it is not exactly the same as that in the Chaozhou dialect. Then in the next 70 years, under the influence of the Chaozhou dialect, which is recognized as a prestige dialect in the Chaoshan area, the consonant ending system of the Shantou dialect is getting closer and closer to that in Chaozhou dialect which leads to the high correlation of these two dialects. Therefore, the horizontal transmission between Chaozhou and Shantou or between individuals speaking Chaozhou and Shantou dialect causes the similarity of the consonant endings between these two dialects. I conduct a quantitative study on the phonological system, including initials, finals, and tones, among several subgroups of the Chaoshan dialect to show the close relation between Shantou dialect and Chaozhou dialect to support this argument in the rest of this chapter.

4.3.1 Population Dynamics in Shantou from 1920s to 1980s

In *Chaoshan Fangyan Lishi Yanjiu* 潮汕方言历时研究, Lin Lunlun (2015: 28) gives a brief overview of the population change and the numbers of migrants in Shantou from 1920s to 1980s as followed:

Table 20 Cluster analysis of the nasal consonant endings among the Chaoshan dialect and Middle Chinese and other surrounding dialects

Year	Population	migrants
1921	60,000	10,000/year
1934	191,000	
1945	150,000	
1946		50,000
1947-1949		50,000
1950	258,000	
1950-1980		2,100/year

From the 1920s to the 1950s, the population in Shantou city increased from 60,000 to 258,000, and most of the population were migrated from the surrounding areas, including Chenghai, Chaozhou, Jieyang, and Chaoyang (Lin 2015: 28). Since the Shantou dialect emerged and was identified as a standard language around 1949 after large scale of migration occurred, it is reasonable to believe that the formation of the Shantou dialect was influenced by population migration. Two large-scale migrations occurred between 1945 and 1949, therefore the population composition of the migrants and the language they were speaking during these periods are essential for the shape of the modern Shantou dialect.

We conducted a quantitative research of the phonetic system between Shantou and other Chaoshan subgroups based on their consonants, finals, and tones, and proposed that the high degree of closeness of the consonant endings between Shantou and Chaozhou is caused by horizontal transmission and language contact.

4.3.2 Sources Materials and Methodology

In *Guangdong Min Fangyan Yuyin Yanjiu* 广东闽方言语音研究, Lin and Chen (2015: 83-86) made a comprehensive comparison of the phonological system of six major subgroups of the Chaoshan dialect, including Shantou, Chaozhou, Jieyang, Chenghai, Chaoyang, and Haifeng. According to this book, all of these six subgroups have 18 consonants and 8 tones, while their finals vary considerably in quality. There are 84 consonants in Shantou, 90 consonants in Chaozhou, 85 consonants in Jieyang, 90 consonants in Chaoyang, and 78 consonants in Chenghai (Lin and Chen 2015: 83).

We calculate fifteen correlation coefficients among six subgroups of the Chaoshan dialect based on the presence of common phonetic components, including consonant, final and tone. The relation between the number of dialects n and the number of correlation coefficient T can be expressed as: $T = n * \frac{n-1}{2}$. There are six subgroups of Chaoshan dialect recording in this book, thus the number of coefficients is 15 ($6 * \frac{6-1}{2}$).

The consonant system is coherent in these six subgroups. All of them have 18 consonants (including zero initial), and most of the characters have the same consonants in these subgroups. Therefore, the correlation coefficients of consonant among these subgroups are 1, which indicates a high degree of coherence. All the consonants are listed as follows (Lin and Chen 2015: 13):

/p/ 波 /pʰ/抱 /b/无 /m/毛 /t/刀 /tʰ/胎 /n/娜 /l/罗 /ts/坐

/tsʰ/错 /s/梭 /z/而 /k/哥 /kʰ/戈 /g/鹅 /ŋ/俄 /h/河 /∅/窝

All of these six subgroups have 8 tones, that is, 阴平,阳平,阴上,阳上,阴去,阳去, 阴入,and 阳入, while the values for them are variant in different subgroups. To calculate

the coefficient of tone between each pair of dialects, for a tone that has the same value in two dialects, the value assigned to it is 1, and for a tone that has a different value in one dialect from the other one, the value assigned is 0. Then we divide the total value by the number of tone eight and get the final correlation coefficient of tone between two dialects. The result is as follow:

Table 21 Correlation of tones among six Chaoshan subgroups

	Shantou	Chaozhou	Jieyang	Chenghai	Chaoyang
Chaozhou	1				
Jieyang	1	1	1		
Chenghai	1	1	1		
Chaoyang	.75	.75	.75	.75	
Haifeng	1	1	1	1	.75

Except for the Chenghai dialect, the other four subgroups of the Chaoshan dialect share the same tone value for each tone, therefore, the coefficients of tone among them are 1.

The numbers of finals are diverse among six subgroups. Our calculation of the coefficient of finals between each pair of dialects is based on the difference and coherence of each final in a final pool between two dialects. First, all of the finals existing in two dialects are collecting into the final pool. Then for a final that only occurs in one dialect but cannot be found in the other dialect or a final in one dialect corresponds to a different final in the other dialect, the value assigned to it is 0, which indicates that this final is different in this pair of dialects. For example, in the pair Shantou-Chaozhou, the final [-iau] gains a value 0 since this final only exists in Shantou but doesn't appear in Chaozhou, and all of the final [-iau] in Shantou corresponds to a different final [-iou] in Chaozhou. For a final that exists in both dialect A and dialect B and is coherent in this pair of dialects, its value is 1, which shows the consistency of this final in two dialects.

For example, in the pair Shantou-Chaozhou, the value assigned to the final [-a] is 1 since all of the characters that have this final in Shantou also have the same final [-a] in Chaozhou, and vice versa. Besides, some finals also exist in both dialect A and dialect B, however, when all of the characters that have this final in dialect A or dialect B are collected, part of them have the same final in the other dialect, while part of them possess different finals in the other dialects. Assume that the number of the finals corresponding to a specific final is n in the final pool, then the value assigned to this final is 1/n. This value shows the degree of similarity of this final between dialect A and dialect B. Since the proportion of characters that have the same final and different finals is not given in *Guangdong Min Fangyan Yuyin Yanjiu*, I assume that the number of characters under the condition n is equal for the convenience of calculation. For example, the value assigned to the final /eŋ/ between Shantou-Jieyang is 1/3, because when all the characters that have this final in Shantou or Jieyang are put together, part of them have the same final in the other dialect, while part of them have another two different finals /ɣŋ/ and /iŋ/ in the other dialect. The value 1/3 expresses the degree of coherence of the final /eŋ/, or the proportion of characters that have this final in both Shantou and Jieyang dialect.

After assigning value to each final, the correlation coefficient of finals between these two dialects can be achieved by dividing the sum of values by the total number of finals in this pair of dialects. For example, the total amount of finals in Jieyang-Chaozhou is 84, among which 2 finals gain a value 0, 75 finals get a value 1, 5 finals are assigned a value ½, and 2 finals gain a value ¼. Therefore, the correlation coefficient of finals between Chaozhou-Jieyang is $(2 * 0 + 75 * 1 + 5 * \frac{1}{2} + 2 * \frac{1}{4}) / 84 = 0.929$. Other results are as below:

Table 22 Correlation of finals among six Chaoshan subgroups

	Shantou	Chaozhou	Jieyang	Chenghai	Chaoyang
Chaozhou	.768				
Jieyang	.831	.675			
Chenghai	.728	.835	.583		
Chaoyang	.801	.656	.929	.557	
Haifeng	.675	.506	.697	.474	.759

According to the data, the final system between Jieyang and Chaoyang is closest related to each other, and the relationship of the final system between Chenghai and Haifeng is remotest.

After calculating the correlation coefficient of consonants S_c, coefficient of tones S_t, and coefficient of final S_f between each pair of dialects, the formula to compute the final correlation coefficient of the phonetic system between two dialects is:

$$S = 0.2 * S_c + 0.2 * S_t + 0.6 * S_f$$

The value assigned to each minor coefficient is based on the importance of each component. Each syllable is made up of five components, including initial, medial, main vowel, ending, and tone. The final which involves medial, main vowel and ending is the most important part to differentiate two syllables, therefore, the value assigned to it is 0.6 out of the total value 1. For example, the correlation coefficient of the phonetic system between Shantou-Chaozhou is:

$$S = 0.7684 * 0.6 + 1 * 0.2 + 1 * 0.2 = 0.8611$$

4.3.3 Result and Cluster Analysis

The result of all the correlation coefficients among six subgroups of the Chaoshan dialect is listed as follows:

Table 23 Correlation of the phonological system among six Chaoshan subgroups

	Shantou	Chaozhou	Jieyang	Chenghai	Chaoyang
Chaozhou	.8611				
Jieyang	.8989	.8051			
Chenghai	.8370	.9011	.7500		
Chaoyang	.8307	.7439	.9071	.6844	
Haifeng	.8053	.7037	.8181	.6845	.8054

The relationship between each pair of dialects from close to remote is arranged as follows:

Table 24 Correlation among six Chaoshan subgroups from close to remote

		Coefficient	Distance
1	Jieyang-Chaoyang	.9071	.0929
2	Chaozhou-Chenghai	.9011	.0989
3	Shantou-Jieyang	.8989	.1011
4	Shantou-Chaozhou	.8611	.1389
5	Shantou-Chenghai	.8370	.1630
6	Shantou-Chaoyang	.8307	.1693
7	Jieyang-Haifeng	.8181	.1819
8	Chaoyang-Haifeng	.8054	.1946
9	Shantou-Haifeng	.8053	.1947
10	Chaozhou-Jieyang	.8051	.1949
11	Jieyang-Chenghai	.7500	.2500
12	Chaozhou-Chaoyang	.7439	.2561
13	Chaozhou-Haifeng	.7037	.2963
14	Chenghai-Haifeng	.6845	.3155
15	Chenghai-Chaoyang	.6844	.3156

According to this data, the relationship between the pair Chaozhou-Chenghai is the closest, and the relationship between Chenghai-Haifeng is the remotest. In fifteen correlation coefficients among six subgroups of Chaoshan dialect, the distances between Shantou dialect and other Chaoshan subgroups are in the location 3, 4, 5, 6, and 9. The correlation coefficients between four pairs of dialects are larger than 0.85, that is,

Chaozhou-Chenghai, Jieyang-Chaoyang, Shantou-Jieyang, and Shantou-Chaozhou. The correlations between four pairs of dialects are smaller than 0.75, including Chaozhou-Chaoyang, Chaozhou-Haifeng, Chenghai-Chaoyang, and Chenghai-Haifeng. Others are ranging from 0.75 to 0.85. The correlation coefficient between Shantou and other Chaoshan subgroups except the Jieyang dialect is between 0.75 and 0.85, which indicates that the distance between the Shantou dialect and other Chaoshan dialects is neither very close nor very remote compared with the distance among other five subgroups.

Cluster analysis of the correlation of phonetic system among six subgroups of the Chaoshan dialect is as followed:

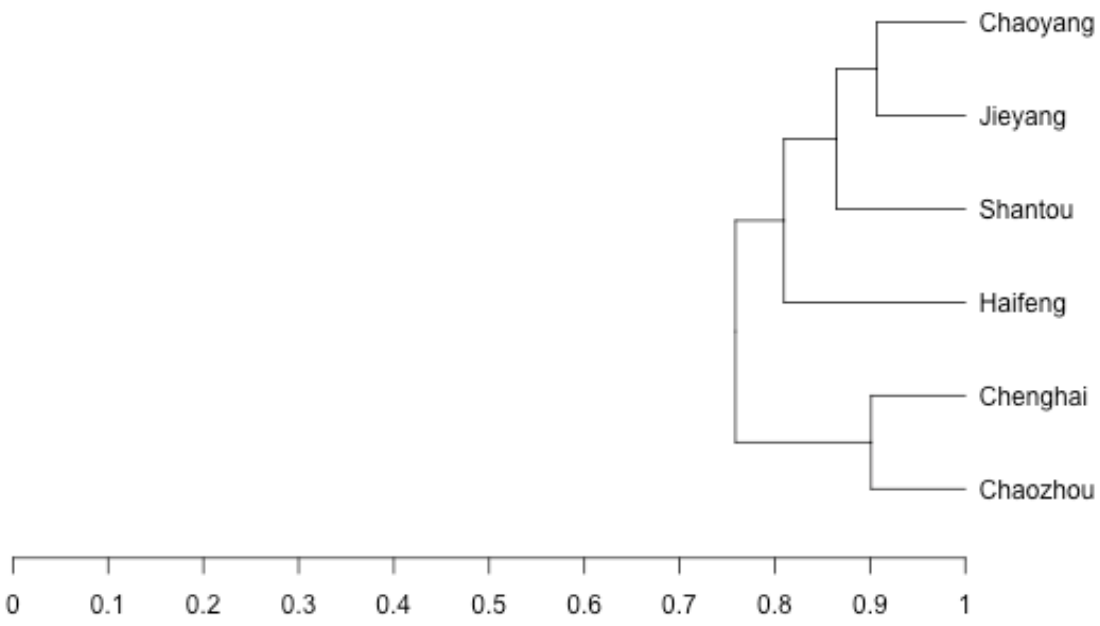

Figure 8 Cluster analysis of the correlation among six Chaoshan subgroups

Since the Shantou dialect emerged in the 1950s after large scales of migration from surrounding areas that have already been occupied by people speaking other subgroups of the Chaoshan dialect, and the population of aboriginals in Shantou before large scales of migration take place is relatively small, we suggest that the phonological

system of modern Shantou dialect is significantly influenced by the languages that migrants were speaking when they moved to Shantou, and Shantou dialect is a mixed language as a result of language contact and horizontal transmission. Our suggestion that the Shantou dialect is the outcome of migration-induced language contact is based on the language principles and processes of language contact. According to Dodsworth (2017: 332-333), there are four major principles in the process of contact-induced linguistic accommodation, including leveling, the emergence of intermediate forms, reallocation, and simplification of grammatical or phonological distinctions. The process of simplification and leveling which involves "the reduction in either the number of linguistic variants or the magnitude of variation among variants" (Dodswoth 2017: 332) presents in the formation of the Shantou dialect. There are some phonological components that only exist in a specific subgroup of the Chaoshan dialect did not survive in modern Shantou dialect in the process of linguistic accommodation, such as the final [-in], [-it] in Haifeng and [-ie] in Chenghai that do not survive in modern Shantou dialect. Besides, according to the result of the analysis of the phonological system among six subgroups of the Chaoshan dialect above, the magnitude of variation between the Shantou dialect and other subgroups is smaller than those among other subgroups.

According to the result of the phonetic distance among six subgroups of the Chaoshan dialect, the correlation between the Shantou dialect with Chaozhou and Jieyang is closer than its relationship with other subgroups of the Chaoshan dialect. Since in most cases in the leveling process, the high-frequency variant that is used more frequently and is more common in the initial population has a larger opportunity to survive, it is

reasonable to believe that a large proportion of the initial migrants in Shantou came from Chaozhou and Jieyang areas.

CHAPTER 5

REMARKS ON PREVIOUS STUDIES AND CURRENT STUDIES

5.1 Studies in Language Contact and Horizontal Transmission

Dodsworth (2017) summarizes the studies in outcomes of large-scale contact between mutually intelligible dialects during the past 10 years, especially the researches on migration-induced dialect contact, and introduces four well-defined linguistic processes and outcomes involving in contact-induced linguistic accommodation, including leveling, emergence of intermediate forms, reallocation, and simplification (Dodsworth 2017: 332-333). Mufwene (2001) suggests that contact language formation (CLF) is the natural outcome of multilingual encounters in various socio-historical contexts. Ansaldo (2009) provided some case studies for probing into the interaction between social factors and linguistic features in this process and indicated that speakers are creative users of the linguistic resources around them (Ansaldo 2009: 83). This idea is in contrast with other idealizations that believe that linguistic purism and linguistically innate features prevent or inhibit speakers from engaging in creative communication.

Besides, Sarah Thomason and Terrence Kaufman (1992: 16) propose that the linguistic constraints on linguistic interference will not work to determine or predict contact-induced language change. The primary determinant of the linguistic outcome of language contact is the sociolinguistic history of the speaker, and a purely linguistic structure is secondary (1992: 35). Further, they distinguish two different kinds of contact situations that might lead to the emergence of mixed language, involving “borrowing” and “language shift” that have different influences on the recipient of the target language.

Shen suggests that the fundamental mechanism of dialect formation is a language shift. Dialects will experience further development after they were formed as a result of language contact when the new prestige language, such as the Han Chinese in China, comes into an area and leads to language shift between the existing dialect and the prestige language. The structure of these two contact languages is important determinants of what linguistic features will survive and which would be leveled out in this process (Shen 2016: 42-43). Another important factor in language shift is the structure of speakers who speak different dialects when their languages come into a contact situation, and the larger the number of speakers speaking the native dialect, the bigger opportunity they would bring their language features into the new coming prestige dialect (Shen 2016: 44). According to Shen (2007: 109), phonological changes in a dialect cannot be explained with the internal structure of a language alone without considering outsider factors since most of the changes we can observe in reality are caused by external factors. In contrast to historical linguistics, one important assumption in which is sound change is regular, Shen (2007: 109, 129) proposes that regular sound change can be a result of language shift. And language shift is a circulating and repeating process in the language history rather than happening once in a specific area or at a specific stage.

Dede (2007) asserts that it is never possible to make predictions about the results of language contact outcomes because all of the features in the pool of a particular linguistic ecology have a chance to be replicated, and the complicate social and historical factors which influence the opportunities for the features to be replicated with some hybrid syntactic forms which result from language contact in various Chinese dialects to support his argument. Gu (2007) discusses the phonological evolution of Shanghai urban

dialect from the respect of language contact induced by immigration based on a phonetic lexical investigation among young people and discusses how the language contacts between Shanghai dialect and mandarin influence the phonetic evolution of Shanghai dialect.

5.2 Quantitative Studies in Chinese Dialects

Cheng (1999) introduced two quantitative methods of expressing the inter-group distance of the Min dialect in Fujian province based on the presence or absence of the common features, including calculating the correlation coefficient between each pair of dialects and computing the dialect mutual intelligibility. The author provides an example of how to choose phonetic features, quantify these features, and calculate the correlation coefficient, which expresses the degree of similarity among dialects. Cheng (1997) introduced several steps about processing the phonological files, such as Hanyu Fangyin Zihui, to derive needed information for calculation.

Wang and Shen (1992) introduce several steps of quantifying the relation among dialects, including selecting linguistic features, quantifying features, calculating the correlation coefficient among dialects, and cluster analysis. Besides, they make a comparison of different methods of cluster analysis, involving Cheng Chin-Chuan (1988)'s Group-average clustering and the Minimum spanning tree and Principal components analysis by Ma Xiwen (1989). The correlation between close or remote relationships and genetic relationships is also discussed in this article.

5.3 Studies in the Phonology of the Chaoshan Dialect

In *Hanyu Fangyan Gaiyao* (Yuan 1960), the Chaoshan dialect is classified into the South Min dialect. The author made a comparison of the Chaoshan dialect with other South Min dialects, such as the Xiamen dialect in Fujian Province, and Wenchang dialect in Hainan Province. It also offers an idea about what phonetic features should be considered to analyze the phonetic system of a specific dialect or to compare the phonology among several dialects. However, this book only describes the phonetic system of the Chaozhou dialect, and the phonetic system of other subgroups, like the Shantou, Chenghai, and Jieyang dialect, are absent.

Lin (2015) introduces the history of the formation and development of the Chaoshan dialect in detail from the Qin dynasty to modern times. Lin examines the relationship between the Chaoshan dialect and the South Min dialect in Fujian Province by comparing their common linguistic features and reviewing the history of the Chaoshan dialect after separating from the South Min dialect in Fujian. The diachronic change of the Chaoshan dialect is also described by taking the phonetic system in Middle Chinese and modern Shantou dialect in comparison. Lin and Chen (1996) describe the phonetic system, including consonant, final, tone value, and modified tones, of the Chaoshan dialect in east Guangdong Province which involves six major subgroups, that is, Shantou, Chaozhou, Chenghai, Jieyang, Chaoyang, and Haifeng dialect. They also detail the inner variation of the Chaoshan dialect by comparing the final system among six subgroups of the Chaoshan dialect and tabulating the pronunciation of 1875 common words in different subgroups. Their comparison of the consonant, final, and tone among six subgroups of the Chaoshan dialect is the source material for calculating the coefficients

of the phonetic system among six subgroups of the Chaoshan dialect and for expressing the inner variation of Chaoshan dialect on a numerical scale in my research.

Wang Yongxin (1998) gives a synopsis of the synchronic and diachronic variation of the Chaoshan dialect by presenting various initials, finals, and tones in several subgroups of the Chaoshan dialect in comparison or inventorying the recording of the phonetic system of Chaoshan dialect in Ming-Qing period corresponding to modern Chaoshan dialect. However, as the features selected for analysis are not extensive, the author cannot offer a systematic description of the synchronic variation of the Chaoshan dialect.

There are various explanations for the formation of the consonant endings in the modern Chaoshan dialect. Li (1986) proposes that colloquial reading changes faster than the literal reading, which results in the phenomenon that many characters that preserve a plosive consonant ending [-p], [-t], or [-k] in literal reading turn to have a glottal stop ending [-ʔ] in their colloquial reading in modern South Min dialect. According to Li, the change N (including [-m] [-n] [-ŋ]) → [˜] and the change [n] → [-ŋ] are caused by the change of vowel number. When the number of vowels increases, the length of the vowels becomes longer than before and at the same time the original nasal endings would be crowded out and change to a nasalized final [˜] which possesses a nasalized function on the preceding vowel. If the number of vowels decreases, the length of the final of a syllable becomes shorter which leads the weight of the nasal endings to increase and the original ending [-n] be replaced by a longer ending [-ŋ] (Li 1986: 47). Corresponding to the change of the nasal consonant endings, the change [-p] [-t] [-k] → [-ʔ] and the change [-t] → [-k] occur. Similarly, Zheng (2012) also attributes the changing of consonant

ending system in the South Min dialect to the change of vowel. She suggests that there used to be a contrast between a long vowel and short vowel in the history of the South Min dialect. The consonant endings followed a long vowel are easy to weaken and turn to a glottal stop [-ʔ] since its pronunciation time is too short, while the endings followed a short vowel have enough pronunciation time hence are preserved in modern dialect (Zheng 2012: 59). Chen (2015) summaries the order of evolutionary of the consonant endings in the Chaoshan dialect as: [-p/t/k] → [-p/k] → [-k] (Chen 2015: 114). There are several subgroups of Chaoshan dialect reflecting different stages of evolution, for example, Haifeng is in the first step, and Shantou, Chaoyang, and Jieyang are in the second step, and Chenghai is in the third step which shows that the Chaoshan dialect in Chenghai has the fastest speed of evolution. Besides, there are two levels of evolution existing in the Chaoshan dialect, that is, [-p/t/k] → [-ʔ] and [-ʔ] → [-0] (the consonant ending is lost, and the syllable has an opening ending). According to Chen, the situation that three evolutionary levels are overlapping in the modern Chaoshan dialect is caused by the situation that each morpheme has different rates of evolution (Chen 2015: 117). Shen (2007) suggests that all the plosive and nasal consonant endings in old Min dialect were lost before the introduction of the literal reading system, and the emergence of the nasalized final [̃] and glottal plosive ending [-ʔ] is a result of language shift (Shen 2007: 116). According to Liu (2009), there are two developing levels of consonant endings in the Chaoshan dialect. The first level involves a combination of the plosive consonant endings [-p] [-t] [-k] into the ending [-ʔ], and the second level is borrowing the endings [-p] [-t] [-k] from other prestige dialects (Liu 2009: 117).

5.4 Different Models of Language Change

5.4.1 Evolutionary Model

Biological models of evolutionary change have been used to explain language change. Croft (2000) applies the general analysis of selection processes to language change and provides paradigm instantiations of this theory in biology and language as follows: (Croft 2000: 37-38)

Table 25 Generalized Theory of Selection

Generalized theory of selection	Paradigm instantiation of selection in biology	Paradigm instantiation of selection in language
Replicator	Gene	Lingueme
Replicators in a population	Gene pool	Lingueme pool
Structured set of replicators	String of DNA	Utterance
Normal replication	Reproduction by e.g. interbreeding	Utterance production in communication
Altered replication	Recombination, mutation of genes	Mechanisms for innovation
Alternative replicators	Alleles	Variants
Locus for alternative replication	Gene locus	Linguistic variable
Interactor	Organism	Speaker (including grammar)
Environment	Ecological environment	Social-communicative context
Selection	Survival and reproduction of organism	Entrenchment of convention by speakers and its propagation in communication

Source: Croft 2000: 37

According to Croft (2000), the linguemes of language are the replicators, the collection of which forms a lingueme pool. It is the behavior of individual speakers that results in changes in the constitution of the lingueme pool, that is, “selection of variants and thus the propagation of a change” (Croft 2000: 199). Therefore, changes in language result from the behavior of the interactors, which are individual speakers of the language.

In Croft's evolutionary model, contact between two societies would bring about transferred (more accurately, replicated) of linguemes from one lingueme pool to another one when some degree of communicative interaction between speakers of the two societies happened. Nettle (1999) and Mufwene (2001) also proposed ideas for similar models that intend to explain language changes. There are two major common characteristics in these models. The first one is "they regard the individual speaker's idiolect as comparable to the biologist's organism and thereby identify 'language' as comparable to the biologists' notion of species" and the second common characteristic is they propose the notion of a "pool", analogous to a gene pool (Dede 2007: 59-60).

5.4.2 Family Tree Model

The family tree model is based on societal divergence and the normal transmission of language. It is the societal divergence results in primary language birth and it is the behavior of individual speakers inside a specific society instead of the communication between two societies that leads to changes in the constitution of the feature pool. Thomason & Kaufman define normal transmission as "a language is passed on from parent generation to child generation and/or via peer group from immediately older to immediately younger, with relatively small degrees of change over the short run, given a reasonable stable sociolinguistic context" (Thomason & Kaufman 1992: 9-10). There are two basic assumptions of the family tree model, that is, sound change is regular without any exception and there is no subsequent contact among the daughter languages after they derived from the proto-language (Campbell 2013: 188). According to the family tree model, it is the changes in the membership of the population by way of biological reproduction and death instead of through speakers from other societies

entering the population that cause language changes, because one assumption of this model is that there are no significant communicative interactions with individuals outside the society.

5.4.3 Horizontal Transmission Model

The family tree model recognizes the formation of dialects as a result of vertical transmission, that is, a language pass from generation to generation without considering any outside factors that might cause language change within a society. The evolutionary model regards the development of a language as the result of a combination of vertical and horizontal transmission, that is, the interactions among individuals in face-to-face contact determine what kind of language features would be selected and enter a feature pool, and the propagation of population influences which language features or language change would be reduplicated in communication. Shen (2017: 21) proposes a new explanation for the formation of Chinese dialects as "the result of horizontal transmission, not the result of vertical transmission or even of a combination of vertical and horizontal transmission". According to Shen, these three kinds of transmission can be presented as followed: (Shen 2017: 49)

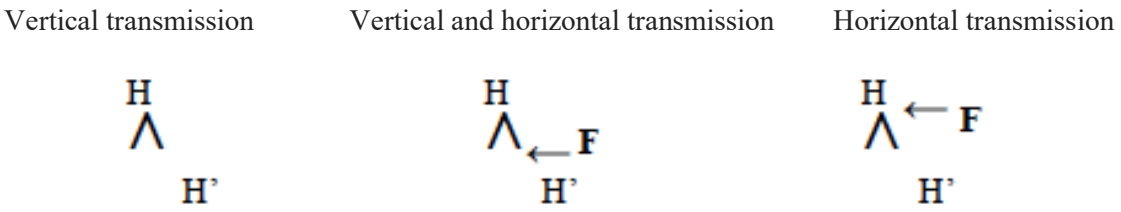

Figure 9 Three kinds of transmission model

In these models, “H”, “F”, and “H’” represent the Han Chinese, non-Han Chinese, and Chinese dialects influenced by the Han Chinese. “→” indicates the effect of non-Han Chinese on the Han Chinese when the Han Chinese disseminates from one region to another. With the Han Chinese in area A spreading to area B where the original local language is F (non-Han Chinese), the process of language shift happens between H and F that results in the emergence of a dialect H’ (Shen 2017: 48). Vertical transmission model denies the influence of outside factors in the formation of dialects, and the combination of vertical and horizontal transmission model suggests that the influence of non-Han Chinese on Han Chinese is exerted after the new dialect was formed, while the horizontal transmission model proposed by Shen regards the impact of outside factors as a reason for the formation new dialects and the division of languages (Shen 2017: 48).

CHAPTER 6

CONCLUSION

6.1 Research Findings

This paper studies the consonant endings, including nasal and plosive consonant endings in the Chaoshan dialect, and tries to explain the variation of the consonant endings among several subgroups of the Chaoshan dialect from the perspective of horizontal transmission and language contact. Five principal subgroups of the Chaoshan dialect are studied in this thesis, that is, Shantou, Chaozhou, Jieyang, Chenghai, and Haifeng. These subgroups are divided into three groups based on the number of consonant endings in each subgroup. Chenghai dialect is in group 1 in which there are two plosive consonant endings [-k] [-ʔ] and two nasal consonant endings [-ŋ] [˜]. Haifeng dialect is in group 2 since the number of consonant endings in this dialect is more than other subgroups of the Chaoshan dialect. There are four plosive and four nasal consonant endings in Haifeng dialect, including [-p] [-t] [-ŋ] [-ʔ] and [-m] [-n] [-ŋ] [˜]. Shantou, Chaozhou, and Jieyang are in group 3 since there are three plosive consonant endings [-p] [-k] [-ʔ] and three nasal consonant endings [-m] [-ŋ] [˜] in these subgroups. In Middle Chinese, there are three plosive consonant endings and three nasal consonant endings, that is [-p] [-t] [-k] and [-m] [-n] [-ŋ]. Compared with the consonant ending system in Middle Chinese, two new endings emerged in modern Chaoshan dialect, including the glottal plosive consonant ending [-ʔ] and the nasalized final [˜] which has a nasalized function on the vowel preceding.

In this paper, we try to explain what causes the increase and decrease of the consonant endings from Middle Chinese to modern Chaoshan dialect and what leads to the divergence of the consonant endings among five subgroups. Previous researches mainly explain this change and the inner variation from the perspective of historical linguistics, that is, the consonant endings of the Chaoshan dialect is weakening which is caused by the linguistic structure within this language instead of external factors outside a society. According to these theories, phonetic changes are regular since there are linguistic laws that can apply generally thorough a language, and there is no further communication among sister languages after they separated from the proto-language. Outside factors only cause sporadic changes which affect only several words rather the whole language. However, this theory cannot provide a thorough explanation for the actual situation of the consonant endings of the Chaoshan dialect.

In this paper, we propose a new perspective which considers the external factors and the language contact between different dialects as the reason for the formation of a dialect that determines what language features are pertained or levelled out in contact situation. The history of the Chaoshan dialect is a history of language contact. The language communication between the indigenous language in the Chaoshan area and the Han Chinese from the central plain is traced back to the Qin and Han dynasty (Lin 1988: 134). From Jin dynasty, with more and more population migrating to the Chaoshan area from the central plains and since the number of the aborigines in the Chaoshan area is relatively small and their culture is primitive, the culture of the central plain dominates and spreads quickly through the Chaoshan area. At the same time, the Han Chinese

overwhelmed the native language spoken by the aborigines and became popular (Lin 1988: 136).

Another large scale of migration from the central plains to the Chaoshan region happened in the late Tang dynasty. The Han Chinese spoken in the north area at that time was brought to the Chaoshan area again and another language contact between the Han Chinese and the local Chaoshan dialect occurred. Since the migrants from the central plains had a higher cultural level and the local people in the Chaoshan area attached more importance to education, the consonant endings appeared in the Chaoshan area again and were preserved in the literal reading system. After that, with more and more migrants from Fujian province, their language was brought into the Chaoshan area and the communication between these migrants and the local residents in the Chaoshan area resulted in the formation of Chaoshan dialect which possesses some features that can distinguish it from other subgroups of the South Min dialect in Fujian Province. According to Lin Lunlun (1988: 141), Chaoshan dialect was formed and distinguished from other South Min dialects in Yuan and Ming dynasty. The language contact in the Chaoshan area is a not a one-time process. In other word, it does not happen one time in a specific period or in a specific area, rather, the process of language contact is happening anytime when there is communication between speakers who speak different languages (Shen 2007: 129). One language can have several language substrata, and the processes of language contact exert influence on what features in different substratum retain in this language (Shen 2007: 120).

Paying attention to the consonant ending system in the modern Chaoshan dialect, it varies among several principal subgroups. We suggest that this divergence is caused by

the situation that the languages that migrants were speaking when they moved to different districts of the Chaoshan dialect were not exactly the same and the languages spoken by the local districts in different districts are not equal as well as the variance of the population structure.

From the perspective of traditional historical linguistics, we cannot reasonably explain the variance of the consonant endings in several subgroups of the Chaoshan dialect. According to their theories, the formation of the consonant ending system of the Chaoshan dialect is caused by the change of the language structure itself without considering external factors as a primary reason. As mentioned in Chapter 1, previous researchers attribute the divergence of modern Chaoshan dialect from Middle Chinese to the length or pitch of the vowels preceding the consonant endings or the speed of evolution of different characters. They propose that the consonant endings in the Chaoshan dialect are experiencing a process of simplifying or weakening and several subgroups of the Chaoshan dialect represent different steps of evolution. Besides, their suggestion that the emergence of the endings [-ʔ] or the nasalized final [̃] is a transitional step before a character loses its original consonant ending and changes to an opening ending syllable. From the perspective of historical linguistics, sound change is regular with no exceptions. However, according to the comparison of the consonant endings between Middle Chinese and five subgroups of the modern Chaoshan dialect in Chapter 2 and Chapter 3, the changing of the consonant endings is disorder instead of regular, and there is no reliable sound law that can describe this situation. Moreover, in Chapter 3.2, we find some characters that have the weaken endings [-ʔ] and [̃] in Chaozhou in the late 19th century turn to have the ending [-k] or [-ŋ] in modern Chaozhou

dialect. If we consider the changing of the consonant endings of the Chaoshan dialect as a process of simplification, then we cannot explain this seemingly reverse condition.

6.2 Horizontal Transmission

The Horizontal transmission theory can better explain the change of the consonant ending system from Middle Chinese to modern Chaoshan dialect and the divergence of the consonant endings among several subgroups of the Chaoshan dialect. Shen (2016: 49) suggests that the formation of a dialect is the result of the influence of non-Han Chinese on the Han Chinese, and both the Han and non-Han Chinese are the reasons for the dialect formation. This theory is different from the vertical transmission which denied the effect of external factors on language change and the combination of the vertical and horizontal transmission which consider the inner structure of a language as the premise of language changing and outside factors as a subsidiary reason. According to the theory that regards the language structure itself as the premise of language, the longer time two languages are separated, the more different they are. However, based on the result of the correlation coefficients among modern Xiamen dialect, Chaozhou dialect in the late 19th century, and five subgroups of the modern Chaoshan dialect in Chapter 3.3, the relationship between modern Xiamen dialect and Chaozhou dialect in the late 19th century is much closer than the relationship between the Chaozhou dialect in the late 19th century and five subgroups of modern Chaoshan dialect. Lin Lunlun (1988: 141) indicates that Chaoshan dialect was separated from other South Min dialects in Yuan and Ming dynasty, therefore, the time distance between Chaozhou dialect in the late 19th century and the modern Chaoshan dialect is much shorter than the time distance between Chaozhou dialect in the late 19th century and modern Xiamen dialect since they were

break up in more than 600 years ago. According to historical linguistics, Chaozhou dialect in the late 19th century and the modern Chaoshan dialect should be closer related than the relation between Chaozhou dialect in the late 19th century and modern Xiamen dialect, but the fact is vice versa. According to horizontal transmission, the distance between two dialects which indicates the degree of divergence between this pair of dialects cannot be simply turned into the length of time they were separated from the proto-language (Shen 2016: 49). The closeness of the consonant ending system between the Chaozhou dialect and modern Xiamen dialect is caused by the similarity of the consonant endings in the dialectal substratum involved in these two dialects and the population structure which influence which consonant endings were retained in a contact situation.

The formation of the Chaoshan dialect is significantly influenced by the language contact between the Han Chinese and non-Han Chinese. After the Han Chinese went through the Miao area before arriving in the Chaoshan area, its consonant ending system is gradually lost since there is no consonant endings in Miao. The consonant endings in the modern Chaoshan dialect were introduced after the emergence of the literal reading system and were influenced by the migrants from Fujian Province. Language contact and horizontal transmission might happen again and again in different areas and different periods, and each time of horizontal transmission brings different dialectal substrata in a specific dialect. Population structure and other social factors determine whether the language features in different dialectal substrata can survive in this dialect. According to Shen (2007: 129), a specific language feature can survive after several times of horizontal transmission. Hence, we conclude that the variance of the consonant endings in several

subgroups of the Chaoshan dialect is caused by the divergence of the consonant ending system in the dialectal substrata existing in different districts of the Chaoshan area and the variance of the population structure and other social factors which might affect the selection of language features rather than through the change of the language structure within a dialect and a society.

The formation of the Shantou dialect can also be described from the perspective of horizontal transmission. Shantou dialect is a mixed language resulted from large scales of migration from the surrounding areas that have already occupied by other subgroups of the Chaoshan dialect. In the contact between migrants and the residents, different language features were introduced into the feature pool in Shantou, and different dialectal substrata incorporated in the formation of the Shantou dialect. The population structure and other social factors determine what language features from different dialectal substrata were selected and retained in the new dialect. The fact that Shantou dialect is much closer to Chaozhou dialect is caused by the prestige position of the Chaozhou dialect at that time and the possibility that a large scale of the initial migrants in the Shantou area come from Chaozhou.

BIBLIOGRAPHY

Ansaldo, Umberto. *Contact Languages: Ecology and Evolution in Asia*. Cambridge, UK: Cambridge University Press, 2009.

Campbell, Lyle. *Historical Linguistics: An Introduction*. Edinburgh: Edinburgh University Press, 2013.

Chen, Peiying. “Zhonggu rusheng yunwei zai Chaoshan fangyan zhong de yanbian 中古入声韵尾在潮汕方言中的演变.” Guangdong jishu shifan xueyuan xuebao 36 (2015): 113-121.

Cheng, Chin-Chuan. "Measuring relationship among dialects: DOC and related resources." *International Journal of Computational Linguistics & Chinese Language Processing*, Volume 2, Number 1, February 1997: Special Issue on Computational Resources for Research in Chinese Linguistics2, no. 1 (1997): 41-72.

Cheng, Chin-Chuan. "Quantitative studies in Min dialects." *Contemporary Studies on the Min Dialects* (1999): 229-246.

Croft, Willian. *Explaining Language Change*. Harlow: Longman, 2000.

Dede Keith, “The Deep end of the Feature Pool: Syntactic Hybridization in Chinese Dialects 汉语方言里的混合句法.” Journal of Chinese Linguistics, Vol 35, No. 1 (2007): 58-80.

Ding, Bangxin. Minyu yanjiu jiqi yu zhoubian fangyan de guanxi 闽语研究及其于周边方言的关系. Chinese University Press,2002.

Dodsworth, Robin. “Migration and Dialect Contact.” *ANNUAL REVIEW OF LINGUISTICS*, VOL 3, (2017): 331-346.

Gu, Qin. “Yuyan jiechu dui Shanghai shiqu fangyan yanbian de yingxiang 语言接触对上海市区方言演变的影响.” PhD diss., Shanghai Daxue (2007).

Hardcastle, William J., and Nigel Hewlett, eds. *Coarticulation: Theory, data and techniques*. Cambridge University Press, 2006.

Huang, Shufen. “*Shantou hua duben* yu 19 shijimo Chaozhou fangyan de yuyin xitong 《汕头话读本》与 19 世纪末潮州方言的语音系统.” Fangyan 1 (2017): 101-121.

Kuhn TS. *The structure of scientific revolutions*: University of Chicago press. Original edition. 1962.

Li, Rulong. “Guanyu dongnan fangyan de ‘diceng’ yanjiu 关于东南方言的 “底层” 研究.” Minzu yuwen no. 5 (2005): 1-15.

Li, Xinkui. *Guangdong de fangyan* 广东的方言. Guangdong renmin chubanshe, 1994.

Lin, Hsiung-ch‘êng. *A Handbook of the Swatow Vernacular*. Printed at the Koh Yew Hean Press, 1886.

Lin, Lunlun and Chen, Xiaofeng. *Guangdong min fangyan yuyin yanjiu* 广东闽方言语音研究. Shantou daxue chubanshe, 1996.

Lin, Lunlun. “Shilun Chaoshan fangyan xingcheng de lishi guocheng 试论潮汕方言形成的历史过程.” Shantou daxue xuebao: Renwen shehui kexue ban Z1 (1988): 131-142.

Lin, Lunlun. *Chaoshan fangyan lishi yanjiu* 潮汕方言历时研究. Jinan daxue chubanshe, 2015.

Lin, Lunlun. *Chenghai fangyan yanjiu* 澄海方言研究. Shantou daxue chubanshe ,1996.

Liu, Zemin. “Hanyu nanfang fangyan rushing yunwei de leixing jiqi yanbian 汉语南方方言入声韵尾的类型及其演变.” Shanghai shifan daxue xuebao: Zhexue shehui kexue ban (2009): 113-118.

Mufwene, Salikoko S. *The ecology of language evolution*. Cambridge University Press, 2001.

Nettle, Daniel. *Linguistic Diversity*, Oxford, New York: Oxford University Press, 1999.

Norman, Jerry. *Chinese*. Cambridge University Press, 1988.

Ohde, Ralph N., and Donald J. Sharf. "Coarticulatory effects of voiced stops on the reduction of acoustic vowel targets." The Journal of the Acoustical Society of America 58, no. 4 (1975): 923-927.

Peking University, Department of Chinese. *Hanyu fangyin zihui* 汉语方音字汇. 2003.

Rao, Zongyi. *Chaozhou zhi* 潮州志. Chaozhou xiuzhi guan, 1946.

Shen, Zhongwei. "Complex Adaptive System and Dynamic Studies of Chinese." Essays on Linguistics 2 (2014): 10.

Shen, Zhongwei. "Yuyan zhuanhuan he fangyan diceng 语言转换和方言底层 [Language shift and dialectal substratum]." Lishi cengci yu fangyan yanjiu 历史层次与方言研究 [*Historical Strata and the Studies of Chinese Dialects*] (2007): 106-134.

Shen, Zhongwei. “Hengxiang chuandi he fangyan xingcheng 横向传递和方言形成.” Journal of Chinese Linguistics Monograph Series 26 (2016): 21-54.

Sarah Thomason and Terrence Kaufman. *Language contact, creolization, and genetic linguistics*. Univ of California Press, 1992.

Wang, Li. *Hanyu yuyin shi* 汉语语音史. Beijing: Zhongguo shehui kexue chuban,1985.

Wang, Shiyuan and Shen, Zhongwei. “Fangyan guanxi de jiliang biaoshu 方言关系的计量表述.” Zhongguo yuwen 19 (1992): 92.

Wang, Yongxin. “Chaoshan Fangyin Neibu Chayi Gaishuo 潮汕方音内部差异概说." PhD diss., 1998.

Yuan, Jiahua. *Hanyu fangyan gaiyao* 汉语方言概要. Wenzi gaige chubanshe, 1960.

Zhan, Bohui. *Xiandai hanyu fangyan* 现代汉语方言. Hubei renmin chubanshe, 1981.

Zhang, Zhenxin. “Minyu jiqi zhoubian fangyan 闽语及其周边方言.” Fangyan 1 (2000): 6-19.

Zheng, Weina. “Minnanyu rusheng yunwei de fenbu xianzhuang jiqi yuanyin tuice 闽南语入声韵尾的分布现状及原因推测.” Shantou daxue xuebao: Renwen shehui kexueban 28, no. 1 (2012): 52-59.